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Design for Evaluation of the New York Medicare Graduate Medical Education Payment Demonstration and Related Provisions in Public Law 105-33 (Balanced Budget Act of 1997)

Recommended Design and Strategy for NY GME Demonstration and National BBA GME Provisions (Tasks 5 and 6 - Basic Contract)

Final Design Report

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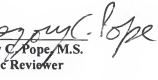

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1 Executive Summary of Evaluation Design

1.1 Three Design-Related Reports

Staff at Health Economics Research and Massachusetts General Hospital submit this revised design report in partial completion of its requirements under the design phase of HCFA's RFP to evaluate several New York and BBH changes in GME funding. This report is the third in a series. The first report summarized the data quality and availability to be used in the evaluation. The second report summarized the perspectives of interested organizations and local New York experts on the demonstration and the content of the proposed evaluation. This report contains a Recommended Design & Strategy for NY GME Demonstration Evaluation (Task 5, as proposed in our letter to the Contacting Specialist, Paula Kolick, March 4, 1999) and a Recommended Design & Strategy for BBA GME Provisions (Task 6). This design report, supplemented by HER's data and perspectives reports form a whole in describing the overall evaluation design strategy. Summaries of the earlier data and perspectives reports are provided in Appendices E and F of this report.

1.2 Case Study Design Site Visits

The design phase of this evaluation funded HER/MGH staff to conduct several "expert" interviews and hospital case studies in New York. This was appropriate given the lack of knowledge about the unique features of the New York health care system and the rapid changes occurring in the state since the demonstration began. Consequently, the design relies heavily on discussions with several key experts in the state (see HER/MGH's Perspectives Report, see Appendix F), complemented by two intensive case study visits in Buffalo and New York City. HER/MGH staff interviewed managers and clinicians in several participating hospitals as well as education program directors and local health care researchers. Where possible, this report integrates and builds upon the case study responses.

Specific case study material appears in Appendix B of the report. We would like to thank all of the (anonymous) participants in our case studies. They gave generously of their time and, while many had reservations about particular aspects of the demonstration, nearly all supported the general concept of downsizing and restructuring residency programs in New York and nationally. They all also strongly supported the notion of a rigorous evaluation of the BBA and the New York voluntary demonstration and gave HER/MGH staff excellent insights on what to look for and possible outcome measures.

1.3 Overall Scope of Evaluation

The evaluation design involves a large range of activities. HCFA's RFP requested 20 major reports: 10 on the New York Demonstration; and 10 BBA-related reports. The New York reports are spaced every 6 months over 60 months while the BBA reports begin 9 months into the evaluation and are to be submitted roughly every 6 months thereafter. In addition, the RFP included 35 detailed research questions to be addressed on the New York Demonstration (in Appendix J-1C of the RFP) grouped into 12 policy domains. Answers to another 43 questions (in J-1D) were requested on the BBA provisions. Many of these questions involve extensive data collection, complex statistical analysis, and/or case study site visits.

Evaluating the New York GME demonstration is a major challenge in itself. In addition, HCFA is also contracting for the evaluation of seven different sections of the Balance Budget Act (Section 4621-4628, excluding 4627). Two of the BBA sections are demonstrations/programs in and of themselves involving voluntary participants. Section 4626 encourages hospitals to join a program very similar to the one in New York and receive transition payments for 20-25% reductions in their residents. All of the same issues surrounding the New York demonstration apply to the Section 4626 program (e.g., control groups, participation bias, meeting targets); yet, Section 4626 is potentially much larger in both the number of participants and its geographic scope. Although HCFA has yet to solicit applications for this program, it is required to do so by October, 1999. Section 4628 is a true

demonstration of the use of consortia that are similar, but not identical, to the GME consortia in New York. How these consortia form, how they distribute GME payments, and how they undertake resident reallocations and downsizing are all major studies.

Certain commonalities reduce the evaluation burden somewhat. Sections 4621 and 4623 concern the impacts on IME and DME of the 3-year rolling average resident count and ceilings on residents and on the ratio of interns and residents per bed. Sections 4622 and 4624 concern the impacts on IME and DME of carving out GME payments from the Medicare managed care premium and paying them directly to teaching hospitals. Sections 4625 and 4628 share in common the support of non-hospital resident education sites (although the consortia demonstration, 4628, involves other consortia relationships as well). Our evaluation design takes advantage of these commonalities by consolidating some of the analysis plans that require similar methods.

1.4 Organization of Evaluation Report & Tasks

Exhibit 1-1 presents a list of evaluation tasks for the New York Demonstration and the several BBA provisions. The list is organized by chapter of HER/MGH's Design Report. Exhibit 1-2 shows the primary data sources supporting each empirical analysis presented in Chapters 4-12. An overview of data sources can be found in Appendix E. Detailed discussion of the data sources is provided in an earlier data report. A brief synopsis of the content of each analytic chapter is provided below.

- **Chapter 2** provides necessary background for formulating the evaluation analysis plans. It includes a summary of the purpose of the New York demonstration and BBA 4626 program, their terms & conditions, and the critical transition payment percentages. HER/MGH staff have already collected some data that we present on participants and withdrawals in New York, data that are valuable in formulating possible control groups. Additional background information on the New York hospital reimbursement changes over the last provided is available in Appendix D.

- **Chapter 3** lays out our proposed quasi-experimental design. It lists the challenges in isolating the impacts of transition payments and how we

propose to overcome them using a 4-way interrupted time series approach. The chapter also includes our recommendations for control groups in both New York and for the 4626 Voluntary Resident Reduction Program.

- **Chapter 4** of the report is the first of several describing our proposed work plans. It focuses on the principal goal of the New York Demonstration and BBA 4626 to downsize residency programs. The chapter responds to many specific questions posed in the appendices of HCFA's RFP that are capsulated in four broad areas: (1) changes in residents versus targets; (2) changes in resident type and programs (e.g., specialty, IMG status); (3) the decision, first, to participate and then to withdraw; and (4) the development of non-physician training programs. These same issues apply to BBA Section 4626 as well. Analyses of resident reductions will rely primarily on four data sources: (1) HCFA IRIS electronic reports of FTE residents used to determine IME and DME payments; (2) applications submitted by participants showing baseline counts and proposed glidepaths plus annual performance reports submitted to HCFA; (3) New York and Medicare Cost Reports plus AHA Survey information; and (4) on-site case study interviews to better understand the reasons behind participation and how reductions were accomplished.

- **Chapter 5** addresses questions concerning the BBA mandatory provisions found in Sections 4621 and 4623. These primarily involve the rolling average count of residents, the ceiling on residents and IRB ratios, and the critical reduction in the IME multiplier. Two other areas included in this chapter involve the impacts on non-hospital resident programs and any special rules developed by Medicare for new facilities and programs that provide some relief from the mandatory provisions. Analyses of BBA mandatory provisions nationwide will rely, again, on IRIS, Medicare Cost Report, and AHA Survey data on resident counts, Medicare IME and DME outlays, and teaching hospital characteristics.

- **Chapter 6** takes up the substitution of other personnel for residents who may have been involved in direct patient care. HCFA's RFP asks very similar questions of both the New York Demonstration and the "Overall BBA." By "overall," we understand HCFA to mean all of the various sections of the BBA pertaining to GME, including the voluntary reduction program, the consortia demonstration, and the mandatory provisions that affect every teaching hospital in the country. Staffing information for New York is provided in detail by the state's Institutional Cost Reports (ICRs)

Exhibit 1-1
List of Evaluation Tasks for the New York Demonstration and BBA

Chapter	New York Demonstration	BBA Provisions
2) Background & Understanding of GME	• Purpose • Terms and conditions • Transition payment percentages • Characteristics of participants • Characteristics of withdrawals	S4626: • Terms and conditions • Transition payment percentages
3) Quasi-Experimental Design	• Evaluation challenges and solutions • Basic 4 way interrupted time series design • Two NY control groups	S4626 [Same as NY Demo] • Two S4626 control groups
4) Changes in Residents and Participants	• Meet resident targets? • Change in resident type (e.g., specialty, gender, IMG status)? • Participation/withdrawal decision? • Expanding Non-physician training programs?	S4626 [Same as NY Demo]
5) BBA Mandatory Provisions		S4621; S4623 • 3-year rolling average? • IME multiplier reduction? • IRB/resident ceilings? • Non-hospital programs? • New facility/program special rules?
6) Substitution for Residents in Patient Care	• Change in reliance on residents versus allied health personnel? • Change in resident involvement in patient care? • Kinds of staffing changes to maintain service delivery?	Overall BBA [Same as NY demo]

Exhibit 1-1, continued
List of Evaluation Tasks for the New York Demonstration and BBA

Chapter	New York Demonstration	BBA Provisions
7) Patient/Service Mix, Access, & Quality	• Change in volume and mix of services? • Change in quality of care? • Change in access to teaching hospitals? • Change in charity care? • Change in preventable admissions and complication rates? • Change in risk-adjusted outcomes? • Community perceptions of access and quality?	Overall BBA [Same as NY demo]
8) Payer Mix, Managed Care, and Hospital Finances	• Change in uninsured/charity care? • Change in payer mix • Dependence on managed care? • Change in hospital finances? • Change in cost per discharge ?	S4626; Overall BBA • Hospital IME revenue replacement strategies? • Change in hospital costliness and competitiveness?
9) Medicare+Choice		S4622 &S 4624 • Increase in DME, IME-eligible discharges? • Hospitals benefitted by additional GME payments? • Impact of AAPCC carveout on negotiated plan rates? • Change in DME inpatient days? • Impact on residents?
10) Non-hospital Providers & Consortia	• Changes in NY consortia programs?	S4625 & S4628 • Types of non-hospital providers? • Number of non-hospital residents and type of programs? Number of non-hospital programs? • Types of consortia? • Changes in consortia programs? • Consortia revenue sharing and decision making?

Exhibit 1-1, continued
List of Evaluation Tasks for the New York Demonstration and BBA

Chapter	NY Demonstration	BBA Provisions
11) GME Enterprise		Overall BBA: • Medicaid GME funding changes? • National size/composition of GME resident trends? • Changes in goals/programs of teaching hospitals? • Impact of BBA and other forces on resident trends? • Negative impacts of GME reforms of greatest concern?
12) Transition Payments & Medicare Outlays	• Net total Medicare savings? • Cost effectiveness of transition payments? • Change in billings/revenues of faculty? • Change in ancillary/indirect costs? • Cost effectiveness of transition payments?	S4626 [Same as NY demo]
13) HCFA Goals & Objectives, Influence of NY Demo on Policy Makers	• Demo impact on health manpower concerns of COGME, AAMC, AMA, MPAC. • Goals, Objectives, and concerns of HCFA staff.	Overall BBA • Influence of NY demo on Congressional policy makers in formulating BBA? • List of key policy makers. • Kinds of information on NY demo requested by national policy makers? • Strategies for acquiring additional NY data?
14) Medicare Administrative Mechanisms for NY Demo	• Accuracy, simplicity, verifiability of participant progress reports ? • HCFA monitoring activities? • Resolution of disputes?	S4626 [Same as demo]
15) Recommendations for Technical Advisory Panel	• Panelist selection criteria. • Possible candidates. • 5 recommendations and justification.	Overall BBA [Same as demo]

Exhibit 1-2

Primary Data Sources for Analyses Included in Chapters 4-12

Chapter	Analysis	Primary Data Sources
4) Changes in Residents and Participants	NY GME Demonstration	
	• Meet Resident Targets?	NY GME applications, participants' annual demonstration reports, NY Fiscal Intermediary's (FI) annual report
	• Change in Resident type (e.g., specialty, gender, IMG status)?	Resident counts & characteristics (char.): IRIS data & AMA residency data; hospital char.: NY State Institutional Cost Reports (NYSICR) & American Hospital Association (AHA) Annual Surveys
	• Participation/withdrawal decision?	Residency program char.: IRIS data; hospital char.: NYSICR & AHA Surveys; qualitative analysis - site visits
	• Expanding non-physician training programs?	Site visits
	BBA Section 4626	
	• Meet Resident Targets?	Applications to participate in Section 4626, participants' annual demonstration reports, miscellaneous data supplied by HCFA project officer
	• Change in Resident type (e.g., specialty, gender, IMG status)?	Resident counts & char.: IRIS & AMA GME program and trainee data; hospital char.: HCRIS Medicare Cost Reports (MCR) extracts & AHA Surveys
	• Participation/withdrawal decision?	Residency program char.: IRIS data; Hospital char.: MCRs & AHA Surveys; Qualitative analysis: site visits
	• Expanding non-physician training programs?	Site visits
5) BBA Mandatory Provisions	BBA Sections 4621 and 4623	
	• 3-year rolling average?	Resident counts: (IRIS data) hospital char.: MCRs & AHA Surveys
	• IME multiplier reduction?	Resident counts (IRIS data); hospital char.: MCRs & AHA Surveys
	• IRB/resident ceilings	Resident counts (IRIS data); hospital char.: MCRs & AHA Surveys
	• Non-hospital programs	Site visits associated with the BBA's Section 4626 Voluntary Resident Reduction Program
	• New facility/program special rules	Special rules: *Federal Register*; Resident counts: IRIS data; Applications: HCFA project officer

Exhibit 1-2, continued

Primary Data Sources for Analyses Included in Chapters 4-12

Chapter	Analysis	Primary Data Sources
6) Substitution for Residents in Patient Care	NY GME Demonstration	
	• Kinds of staffing changes to maintain service delivery?	Staffing & hospital char.: NYSICRs; other hospital char.: AHA Surveys Qualitative analysis: site visits
	• Change in reliance on residents?	Site visits
	Overall BBA	
	• Change in residents involvement in patient care?	Staffing & hospital char.: IRIS data, AHA Surveys, and MCRs; Qualitative analysis: site visits
7) Patient/Service Mix, Access, & Quality	NY GME Demonstration	
	• Change in volume and mix of services?	Patient and medical condition volume and mix: NY State's Statewide Planning and Research Cooperative System (SPARCS) discharge abstracts; Resident specialty: IRIS data; Hospital char.: NYSICRs & AHA Surveys
	• Change in quality of care?	Hospital discharges: SPARCS Qualitative analysis: site visits
	• Change in access to teaching hospitals?	Selected payer and medical condition volume and mix: SPARCS; Hospital char.: NYSICRs & AHA Surveys
	• Change in charity care?	NYSICRs
	• Change in preventable admissions and complication rates?	Selected medical conditions: SPARCS Outpatient performance indicators: Outpatient data obtain from NY City's Health & Hospitals Corp.
	• Change in risk-adjusted outcomes?	Mortality complications: SPARCS, GNYHA algorithms
	• Community perceptions of access & quality?	Site visits
	BBA Section 4626	
	• Change in volume and services and their mix?	Hospital discharges: MCRs & MedPAR; resident specialty: IRIS data; hospital char.: MCRs & AHA Surveys
	• Change in quality of care?	Hospital discharges: MedPAR
	• Change in access to teaching hospitals?	Selected payer and medical condition volume and mix: MCRs & MedPAR hospital char.: MCRs & AHA Surveys

Exhibit 1-2, continued

Primary Data Sources for Analyses Included in Chapters 4-12

Chapter	Analysis	Primary Data Sources
8) Payer Mix, Managed Care, and Hospital Finances, continued	NY GME Demonstration	
	• Change in charity care?	Payer mix: NYSICRs; Hospital char.: NYSICRs & AHA Surveys
	• Change in payer mix?	Payer mix: NYSICRs; Hospital char.: NYSICRs & AHA Surveys
	• Dependence on managed care?	Payer mix: NYSICRs; Hospital char.: NYSICRs & AHA Surveys
	• Change in hospital finances?	Hospital revenues, costs, financial ratios, & operating & total margins: NYSICRs Hospital char.: NYSICRs & AHA Surveys
	• Change in cost per discharge?	Hospital costs & discharges: NYSICRs Hospital char.: NYSICRs & AHA Surveys
	BBA Section 4626: Overall BBA	
	• Change in payer mix?	Payer mix: financial statements directly from participants and MCRs for non-participants; Hospital char.: MCRs & AHA Surveys
	• Dependence on managed care?	Payer mix: financial statements directly from participants and MCRs for non-participants; Hospital char.: MCRs & AHA Surveys
	• Change in hospital finances?	Hospital revenues, costs, financial ratios, & operating & total margins: financial statements directly from participants and MCRs for non-participants; Hospital char.: MCRs & AHA Surveys Qualitative analysis: site visits
	• Change in costliness/competiveness?	Hospital costs & discharges: MCRs Hospital char.: MCRs & AHA Surveys
	• IME revenue replacement strategies?	Site visits
9) Medicare+Choice	BBA Sections 4622 & 4624	
	• Increase in IME-eligible discharges?	HCFA-collected encounter data & MCRs
	• Hospitals benefitted?	Hospital char.: MCRs & AHA Surveys
	• Impact of AAPCC carveout on negotiated plan rates?	Site visits associated with the BBA's Section 4626 Voluntary Resident Reduction Program
	• Change in DME inpatient days?	HCFA-collected encounter data & MCRs
	• Impact on residents?	Resident counts: IRIS data

Exhibit 1-2, continued

Primary Data Sources for Analyses Included in Chapters 4-12

Chapter	Analysis	Primary Data Sources
10) Non-hospital Payments & Consortia	NY GME Demonstration	
	• Changes in NY consortia programs?	Resident counts: IRIS data Qualitative analysis: Site visits
	BBA Sections 4625 & 4628	
	• Types of non-hospital providers?	HCFA reports
	• Number of non-hospital residents and types of programs?	Resident counts: IRIS data Types of programs: HCFA reports
	• Number of new non-hospital programs?	HCFA reports
	• Types of consortia?	HCFA project officer
	• Changes in consortia programs?	HCFA project officer & AAMC consortia surveys
	• Consortia revenue sharing and decision making?	Site visits
11) GME Enterprise	Overall BBA	
	• Medicaid GME funding changes?	Survey of all 50 state Medicaid programs
	• National size/composition of GME resident trends?	Resident counts & char.: IRIS & AMA GME program (Green Book) and Trainee survey data
	• Changes in goals/programs of teaching hospitals?	Site visits associated with NY GME demonstration & the BBA's Section 4626 Voluntary Resident Reduction Program
	• Impact of BBA and other forces on resident trends?	Residency program char.: IRIS data; Hospital char.: MCR & AHA Surveys
	• Negative impacts of GME reform of greatest concern?	All empirical studies elsewhere; Site visits
12) Transition Payments & Medicare Outlays	NY GME Demonstration	
	• Change in billings/revenues of faculty?	Medicare discharges: MedPAR; Physician charges: Medicare Part B physician claims
	• Change in ancillary/indirect costs?	Inpatient charge data: SPARCS Cost-to-charge ratios: NYSICRs
	• Cost effectiveness of transition payments?	Transition outlays: HCFA FI Resident counts: IRIS data
	• Net total Medicare savings?	Aggregate of above results
	BBA Section 4626	
	• Change in billings/revenues of faculty?	Medicare discharges: MedPAR; Physician charges: Medicare Part B physician claims
	• Change in ancillary/indirect costs?	Inpatient charges data: MedPAR; Cost-to-charge ratios: MCRs
	• Cost effectiveness of transition payments?	Transition outlays: HCFA FI Resident counts: IRIS data
	• Net total Medicare savings?	Aggregate of above results

while AHA Survey information has a very abbreviated list of occupations. Site visits to New York and non-New York teaching hospitals will be used to describe different staffing substitutions made in response to downsizing.

- **Chapter 7** considers questions relating to patient mix, service mix, access to teaching hospitals, and the quality of care. HER/MGH staff have added two special studies of preventable admissions and ways of measuring complication rates using claims data. Case studies of perceptions in the community regarding access and quality would be undertaken as well. The same analyses would apply where feasible to both the New York Demonstration and to all of the BBA provisions. New York's SPARCS all-payor claims data base forms the core for analyses of patient and service mix, access, and quality changes in New York. MedPAR claims serve an identical role for evaluating the companion 4626 program nationally. New York's Health & Hospitals Corporation also has its own monitoring system for quality that we hope to use to track the performance of attending physicians.

- **Chapter 8** treats questions regarding changes in payer mix and managed care and how the Medicare GME demonstrations and provisions affected hospital cost and finances. The RFP had few questions specifically on these topics but several were implied by Deliverable A8. Two questions under the BBA sharpen the evaluation focus by emphasizing revenue replacement strategies and any changes in hospital costliness and competitiveness. The latter is a hoped-for result of resident downsizing that would make expensive teaching hospitals better able to offer discounts to managed care plans. While these financial questions apply to all teaching hospitals, special emphasis will be given to those participating in the New York Demonstration and under Section 4626. New York ICRs provide substantial detail on hospital payer mix and hospital finances. Outside New York, Medicare Cost Reports and AHA Surveys provide more limited information on payer mix and finances. We hope to supplement them with financial statements from participants.

- **Chapter 9** presents our evaluation plans for the Medicare+Choice Sections 4622 and 4624 of the BBA. Under these provisions, GME costs embedded in the AAPCC are carved out and paid directly by HCFA to teaching hospitals. The evaluation plan quantifies the number of Medicare discharges affected, the additional payments made under these provisions, and what impact they may have had on hospitals maintaining residents. Most important will be the study of the indirect effect the carve outs have

had on rates negotiated by Medicare plans. It is quite possible that plans will negotiate even lower rates and recover much of the GME carve outs debited from their Medicare premiums. Medicare Cost Reports will provide eligible FTE counts and IME and DME outlays. We will obtain HCFA encounter data to measure HMO discharges. Site visits to hospitals and a few Medicare HMO plans will provide at least subjective information on changes in discounting strategies after the GME carve outs.

- **Chapter 10** lays out two analyses of payments to non-hospital providers and the BBA Consortia Demonstration. We recognize these as separable initiatives and will present the findings separately. Their commonality is in the sharing of GME payments between consortium members (4628) or between non-hospital providers and hospitals (4625), the last of which will have their FTE counts reduced to avoid double payment. The evaluation of non-hospital providers under 4625 focuses on the number and type of non-hospital providers taking advantage of the provision and the kinds of training programs developed. Consortia questions address the types of programs shared, how revenues are shared, their decision-making processes, etc. As Consortia applications have not been solicited, it is difficult to finalize our evaluation plans. We further assume that several analyses of hospital performance discussed in earlier chapters would also be conducted on BBA consortia hospitals as well. To address basic questions on types and characteristics of non-hospital providers and consortia members, we will rely on HCFA reports submitted by those eligible for payment and any special reports submitted to the project officer. Any other outcomes analyses will use the same data sources as for other non-New York teaching hospitals.

- **Chapter 11** responds to HCFA's request for a broad, national quantitative overview of GME enterprise. We describe how we will monitor trends in residents and programs and the changing goals of teaching hospitals. We also will describe how states may have changed their funding of GME and what role market forces have had on teaching hospitals independent of BBA provisions. National trends will be tracked using a combination of IRIS data and AMA information on programs and trainee characteristics. A primary survey of all 50 states is proposed to describe changes specifically in GME funding (although secondary plan amendment information in HCFA may suffice). Site visits are necessary to characterize changes in goals and missions from downsizing and eliminating programs. HCFA also asks an overarching question about the negative impacts of the BBA that were of greatest concern and which provisions caused them. We will answer these global questions by

summarizing our findings across several chapters and through interviews with hospital managers and program directors nationwide.

- **Chapter 12's** evaluation plan goes beyond HCFA's RFP in quantifying savings to Medicare from the New York Demonstration and BBA's Voluntary Resident Reduction Program. Offering transition payments should encourage greater resident downsizing, how much so depends upon factoring out other confounding factors like private managed care. We propose to quantify net Medicare savings by using estimates of transition payment effects on resident reductions. We also present evaluation plans for HCFA's request to measure any offsetting billings of Part B attending physician faculty and to evaluate the impact of resident reductions on hospital ancillary and indirect costs. A similar analysis would be done for the BBA 4626 program. Increased faculty billings in New York will be tracked by merging Medicare Part B physician claims with MedPAR discharges. New York ICRs will provide department cost-to-charge ratios that are used to convert SPARCS all-payor claims on ancillary charges to costs. MedPAR claims and Medicare Cost Reports provide analogous data sources. Transition payments will be available from HCFA's FI and changes in residents from IRIS.

- **Chapter 13** presents our plans for identifying the goals, objectives and concerns of HCFA's staff and for evaluating the influence that the New York Demonstration had on Congressional policy makers and others when formulating the BBA 4626 program and other provisions. HCFA's RFP asks the contractor to survey key HCFA staff involved in the initial negotiations with New York hospitals regarding their goals and expectations from the demonstration. We suggest the kinds of persons at HCFA who might be interviewed and include a precis of an interview protocol. A list of national policy makers we recommend conducting interviews with is given next. HCFA has also requested that we inquire about the kinds of information policy makers would like to see from our evaluation, and strategies we might suggest for acquiring the information.

- **Chapter 14** responds to HCFA's request to evaluate its own mechanisms for administering the New York Demonstration and 4626 program. We will evaluate the accuracy, simplicity, and verifiability of the reports participants are required to submit to HCFA. We will evaluate HCFA's monitoring activities using these reports and other contacts. Finally, we will interview hospital, FI, and HCFA staff regarding the timely resolution of disputes. A similar evaluation will presumably apply to the 4626 program as well when it is implemented.

- **Chapter 15** gives our recommendations for the Technical Advisory Panel requested by HCFA. We review panelist selection criteria and the groups we would like to see represented on the panel. We next list several candidate names and make 5 recommendations based on the list.

1.5 Structure of Analytic Chapters & Appendices

Chapters 4-12 form the core analytic chapters of HER/MGH's revised evaluation design. Each chapter begins with an overview of the issues addressed in the chapter, followed by a detailed listing of the key policy and research questions taken from HCFA's RFP. HER/MGH staff have added additional questions were appropriate. Subsequent chapter sections are presented in one of two ways. Either plans are presented according to the use of tabular or multivariate techniques or by research topic area. A brief description of data sources is included in each chapter with references to Appendix E.

This report also includes six appendices.

- **Appendix A** presents a model of the hospital demand for residents and factors influencing the willingness to participate in a voluntary resident reduction program. The appendix derives a formula for the effective wage of residents that plays a major role in hospitals' decision to expand or contract their programs. It also develops a formula measuring the net cost to hospitals of reducing residents. This formula includes the foregone IME and DME payments from downsizing plus the additional staffing costs in patient care. Transition payments are incorporated as an inticement to downsize and reduce the net cost of downsizing.

- **Appendix B** collates the comments HER/MGH staff received concerning the decision to participate when they interviewed participants in the first few months of 1999. Comments are grouped according to the six primary reasons for participation: volume, program, affiliations, payer dependence, staff replacement, and uncertainty.

- **Appendix C** provides methodological detail for three complex statistical analyses proposed in Chapter 4. One analysis covers panel estimation techniques designed to isolate the effects of transition payments and BBA mandatory provisions. A second analysis describes our statistical approach to explaining the participation / withdrawal decisions. The third

- **Appendix D** provides further background detail on national GME payment reforms and New York GME initiatives over the last decade.

- **Appendix E** summarizes the many data bases proposed to support the evaluation, including HCFA's IRIS resident data reporting system, Medicare and New York patient claims, Medicare and New York hospital cost reports, AHA hospital statistics, among other sources.

- **Appendix F** summarizes the comments and observations of several interested and knowledgeable associations, government representatives and researchers, including the Greater New York Hospital Association, the New York State Health Department and Council on GME, the AAMC, AMA, and MedPAC. Interviews were also conducted with experts in New York on resident workforce, patient access and quality, and hospital financial issues.

1.6 Excluded Design Material

This report does not include a personnel tasking chart, project organization chart, or time-phasing chart by task. Given uncertainties surrounding the scope of the national programs and demonstrations that were not yet implemented, plus lack of knowledge about data bases and possible confounding factors affecting residents, HCFA funded a separate design phase contract to HER staff. Upon acceptance of this design report that focuses on the scope and methods of evaluation, it is HCFA's intention to issue a request to HER/MGH to propose personnel tasking and time-phasing charts. The exact number of deliverables and their timing depends in part on the status of the national voluntary reduction program and consortia demonstration, neither of which have been implemented by the date of this report. HER/MGH is open to suggestion as to the content and timing of various reports.

2

Background and Understanding of GME Payment and Reforms

2.1 Background and Understanding of the New York Medicare GME Demonstration

In the last several years, many changes have taken place in the way in which Medicare pays for Graduate Medical Education, both nationally and specifically in the State of New York. Nationally, the Balanced Budget Act passed by Congress in the Fall of 1997 included many sections altering the level and methods for GME funding in the Medicare program across the nation. Several sections mandated reductions in the Indirect Medical Education (IME) multiplier, capped both the resident-per-bed ratio for IME payment and the number of residents for Direct Medical Education (DME) payment, established rolling three-year averages in computing resident counts, among other changes. In addition, the BBA also instituted a voluntary resident reduction program (Section 4626) with "hold harmless" transition payments for hospitals reducing their resident counts by at least a minimum 20 percent. The BBA also established a demonstration under which Medicare DME payments would be made to qualifying consortia rather than member institutions. Detailed descriptions of these programmatic changes are given in subsequent chapters along with proposed impact analyses.

Even prior to the BBA, however, many teaching hospitals in New York State applied to HCFA to receive transition payments for reducing their resident counts by at least a prespecified percentage. Eventually, HCFA negotiated a demonstration with individual, joint, and consortia of teaching hospitals that began a few months prior to enactment of the BBA. This chapter focuses on the New York GME demonstration with occasional comparisons with the national BBA voluntary reduction program (4626) which is quite similar. The reader is referred to Appendix D for background descriptions of the history of

Medicare and New York GME payment methods, the growth in residents and program outlays, and recent policy changes.

The chapter is in two substantive sections. Section 2.2 provides an overview of the purpose, terms & conditions, and phasing of the New York demonstration. Section 2.3 summarizes the characteristics of the demonstration participants. The summary serves two purposes. First, it alerts analysts to any differences between participants and non-participants that should be accounted for in the evaluation design. Second, it also highlights differences between remaining participants as of April 1999, and those that have dropped out. The high drop-out rate raises challenges to the evaluation design that are addressed in subsequent chapters.

2.2 The New York State GME Demonstration Project

The New York State GME demonstration proposal emerged in 1996 in the wake of Congressional proposals to reform the GME funding mechanism under Medicare. Throughout the year, groups such as the Physician Payment Review Commission strongly supported policies to reduce residency positions. As the state with the largest GME programs in the country, New York would bear a disproportionate share of these cuts. To prepare for imminent Medicare reforms, the Greater New York Hospital Association proposed the demonstration project to the Health Care Financing Administration. On February 7, 1997, HCFA awarded waivers to 42 New York State hospitals to participate in the GME demonstration.

2.2.1 Purpose

The demonstration addressed several noted problems with the GME program that were especially prevalent in New York State. In particular, critics claimed that hospitals within the state were maximizing the number of residents trained in order to increase reimbursement and deliver services. Particularly in New York City, hospitals increasingly relied on residents to fill service needs, despite a looming oversupply of physicians.

Meanwhile, the state was training a disproportionate number of residents in hospital-based specialties while national health care trends clearly indicated that these specialties were over-supplied. The NY demonstration attempts to address these problems by encouraging the state to reduce the number of residents and increase the proportion of primary care residents within programs.

2.2.2 Terms and Conditions

In order to fulfill the requirements of the demonstration, the original 42 Phase I participating hospitals, which train about a third of state residents, must reduce the size of their GME programs by 20 to 25% while maintaining or increasing the proportion of their primary care programs. Annual reduction goals are based on the number of residents in the 1996-97 GME program year. In exchange for resident reductions in the state demonstration, the Health Care Financing Administration will provide transitional payments based on the Medicare DME and IME payments that hospitals would otherwise forego as they reduce residents. Hospitals that meet these reduction goals will receive declining transition payments for the 6-year duration of the demonstration based on number of residents in the 1997 baseline. Transitional payments to participants in the New York demonstration will be reimbursed to Phase I and II sites on the following schedule. Also shown for comparison purposes are the payment percentages for the BBA national program. These transition payments, which were expected to total 400 million dollars in New

Medicare Graduate Medical Education Payment Percentages During the Transition Period

	Transition Percentages		
	NY GME Demo Phase		BBA
Year	I	II	Section 4626*
1	100%	–	100%
2	95	100%	100
3	85	100	75
4	70	75	50
5	50	50	25
6	25	25	–

* No transition payment for the first 5% reduction in FTEs (allopathic and osteopathic only)

York over 6 years,[1] are intended to assist hospitals in reorganizing their service delivery infrastructures to make them less resident dependent. The demonstration hospitals (before drop-outs) estimated that they would eliminate over 2,000 resident slots out of the 10,286 offered prior to the demonstration.

While the demonstration specifies the number of resident positions that must be cut, it does not specify how and where these reductions are to be made except for maintaining (or increasing) the primary versus specialty care ratio. Therefore, hospitals decide which resident positions to eliminate under the demonstration. The project is also silent on the issue of International Medical Graduates (IMGs), who comprise 50 percent of the residents in New York State (CHWS, 1998). The majority of residents in many inner city and underserved areas are IMGs, so cuts in these residents may result in gaps in services and access.[2]

In order to receive financial benefits for reducing residents, participating hospitals or consortia must comply with a specific set of terms and condition (see Exhibit 2-1). The terms & conditions of the national BBA program and the New York demonstration, like the transition cost percentages, are quite similar. Participants must increase their primary care share of residents by 20 percent unless they are in a consortium in which case they must maintain their baseline share. Penalties for failure to meet reduction goals range from reductions in transition payments to the requirement that hospitals or consortia refund all transition payments received during the demonstration. As a general rule, an awardee organization will not receive any transition payments for a year if it fails to perform within 95% of its annual cumulative target, or if in year 5 it fails to perform within 95% of its Base Year primary care share ratio. By far the strictest penalty goes to hospitals or consortia that do not meet their five-year target. If such an organization "materially" fails to meet its

[1] Over 25 hospitals had dropped out by the end of the demonstration's second year, resulting in substantial reductions in expected transition payments and projected savings for Medicare.

[2] Representative Pallone of New Jersey, on April 12, 1999, wrote the HCFA administrator about his concern over unintended cuts in IMGs occuring as a result of the demonstration. He cited statistics produced by SUNY - Albany's Center for Workforce Studies on a 12% reduction in IMGs among participating hospitals versus a 6% increase in USMGs. The Congressman insisted that "adequate protections for IMGs must be included in this [demonstration] program. IMGs fill a critical need in the American health care delivery system, particularly in underserved areas."

targets, HCFA will require a full refund of the total transition payments made throughout the demonstration.

These penalties pose different potential impacts for individual hospitals and consortia. While individual participants are held to their specific reduction targets in order to receive transition payments, hospitals within consortia may only receive payments if consortia-wide reduction goals and primary care ratios are achieved. As a result, individual hospitals that have met their reduction goals could potentially lose transition payments if the consortia has not achieved the goals. Thus, consortia participation has some inherent risks. These risks are potentially offset by the benefits of participating in consortia. Most prominent among these benefits is the flexibility to reduce residents by 20 percent rather than the 25 percent target that applies to individual hospitals. Other benefits are discussed in the modelling sections to follow.

While the penalties for failure may appear severe, they are tempered by some flexibility for organizations to slightly revise their targets under certain defined circumstances. For example, an awardee organization may request a revision to its future target levels by December 1 of a given program year provided that: (a) its performance is "on track"; and (b) the revisions still enable the organization to meet its complete 5-year reduction target. More flexible provisions apply if participants undergo organizational changes that may significantly affect hospital or consortia operations. In the event of a merger, acquisition, or de-acquisition, the terms and conditions for participating in the demonstration will be open for review; HCFA will consider reasonable requests for revisions.

2.2.3 Two Phases

The New York demonstration was to take place in two phases; Phase I, which began on July 1, 1997, includes 3 consortia encompassing 18 hospitals, 5 joint applications involving 12 hospitals, and 12 individual hospitals. Phase II of the demonstration began July 1, 1998, with the addition of 6 Rochester consortia hospitals (who subsequently dropped out

within a few months) and one individual hospital (Bronx Lebanon). Table 2-1 shows the 49 participants in the demonstration by individual and consortium status. Dropouts as of April 1999, are in bold print.

2.3 Characteristics of New York Demonstration Hospitals

2.3.1 By Location and Teaching Status

Characteristics of the New York State demonstration hospitals are summarized in Table 2-2, which lists the number of participants by type and area as a subset of all state hospitals with non-zero intern-resident to bed (IRB) ratios in HCFA's 1998 and 1999 Provider-Specific Files. In this table, the geographical areas of the demonstration are separated into "New York City", representing the New York City metropolitan area, the " NYC Suburban Ring", comprising teaching hospitals from suburban counties contiguous to New York City; and "Upstate", representing northwestern New York State. The table also shows the demonstration participants as a proportion of the total teaching and Academic Medical Centers in the state. Within these categories, the table shows descriptive statistics to characterize the hospitals, including mean IRB ratio, mean 1996 residents, and Medicaid Inpatient Day share. These figures compare the demonstration hospitals along dimensions that indicate the comparative size of resident programs, their level of uncompensated care, and their reliance on Medicare and Medicaid.

Participants in the demonstration included 46 out of the state's 105 teaching hospitals.[3] The number and rate of participation varied across the three geographic regions (see Table 2-2). Hospitals in the New York Metropolitan area had the highest initial participation rate, as 32 of New York City's 53 teaching hospitals, or 60 percent chose to participate. Among the 24 hospitals in the suburban ring, only three of the 24 teaching hospitals or 12.5 percent signed on to the demonstration. In the upstate region, eleven of the

[3]Two of NY's teaching hospitals are not included in the statistics presented in Table 2-2 because they are PPS-exempt facilities: Roswell Park Cancer Institute and Childrens' Hospital in Buffalo. According to information in HCFA's *Provider Specific Files*, Park Ridge Hospital in Rochester does not have residents even though it is (was) a demonstration participant – thus, it is not included in Table 2-2 either.

Table 2-1

New York GME Demonstration Participants

Medicare ProvID	Hospital	City	County	Academic Medical Center	Beds 1996	FTE Residents 1996	IRB Ratio 1996	Medicaid Share 1996
NEW YORK METROPOLITAN HOSPITALS								
Individual and Joint Participants								
330059	***Montefiore Medical Center***	Bronx	Bronx	Y	1132	850	0.75	0.29
330012	***Presbyterian Hospital***	New York	New York	Y	1311	837	0.64	0.36
330046	***St Lukes - Roosevelt Hospit***	New York	New York		1187	703	0.59	0.43
330101	***New York Hospital***	New York	New York	Y	964	557	0.58	0.25
330195	Long Island Jewish Medical	New Hyde Park	Queens		587	467	0.80	0.16
330290	***St Vincents Hospital Medica***	New York	New York		656	350	0.53	0.32
330202	Kings County Hospital Cente	Brooklyn	Kings		837	327	0.39	0.68
330194	Maimonides Medical Center	Brooklyn	Kings		635	310	0.49	0.30
330080	Lincoln Medical & Mental Hl	Bronx	Bronx		531	299	0.56	0.73
330127	Jacobi Medical Center	Bronx	Bronx		627	289	0.46	0.58
330009	Bronx-Lebanon Hospital Cent	Bronx	Bronx		516	265	0.51	0.73
330169	***Beth Israel Medical Center***	New York	New York		662	241	0.36	0.38
330152	***Long Island College Hospital***	Brooklyn	Kings	Y	557	230	0.41	0.36
330199	Metropolitan Hospital Cente	New York	New York		387	205	0.53	0.68
330240	Harlem Hospital Center	New York	New York		650	202	0.31	0.55
330357	***Catholic Med Ctr Of Brookly***	Jamaica	Queens		1077	196	0.18	0.40
330397	Interfaith Medical Center	Brooklyn	Kings		590	187	0.32	0.60
330399	***St Barnabas Hospital***	Bronx	Bronx		343	184	0.54	0.49
330196	***Coney Island Hospital***	**Brooklyn**	**Kings**		**382**	**125**	**0.33**	**0.51**
330396	Woodhull Medical/Mental Hlt	Brooklyn	Kings		369	114	0.31	0.72
330385	North Central Bronx Hospita	Bronx	Bronx		295	112	0.38	0.69
330100	New York Eye And Ear Infirm	New York	New York		103	27	0.27	0.25
Consortia								
Mt Sinai Consortium								
330024	***Mt Sinai Hospital medical Center***	New York	New York	Y	905	511	0.56	0.29
330128	***Elmhurst Hospital Center***	Flushing	Queens		485	241	0.50	0.60
330231	Queens Hospital Center	Jamaica	Queens		603	147	0.24	0.26
330133	***Cabrini Medical Center***	New York	New York		433	128	0.30	0.66
NYU Consortium								
330204	***Bellevue Hospital Center***	New York	New York	Y	627	302	0.48	0.46
330056	Brooklyn Hospital Center	Brooklyn	Kings		641	273	0.43	0.33
330214	***Nyu Med Center-University H***	New York	New York	Y	686	269	0.39	0.12
330119	***Lenox Hill Hospital***	New York	New York		572	190	0.33	0.64
330064	***New York Downtown Hospital***	New York	New York		300	117	0 39	0.06
330389	***Hospital For Joint diseases***	New York	New York		213	65	0.31	0.15

Table 2-1 (continued)

New York GME Demonstration Participants

Medicare ProvID	Hospital	City	County	Academic Medical Center	Beds 1996	FTE Residents 1996	IRB Ratio 1996	Medicaid Share 1996
NEW YORK SUBURBAN RING								
330234	***Westchester County Medical***	Valhalla	Westchester	Y	497	229	0.46	0.22
330184	***Sound Shore Medical Center***	New Rochelle	Westchester		253	61	0.24	0.20
330086	Mt Vernon Hospital	Mount Vernon	Westchester		193	29	0.15	0.32
UPSTATE HOSPITALS								
Rochester Consortium								
330285	***Strong Memorial Hospital***	Rochester	Monroe	Y	614	437	0.71	0.14
330125	***Rochester General Hospital***	Rochester	Monroe		496	103	0.21	0.13
330164	***Highland Hospital***	Rochester	Monroe		241	69	0.28	0.13
330183	***Genesee Hospital***	Rochester	Monroe		349	66	0.19	0
330275	***St Marys Hospital***	Rochester	Monroe		227	57	0.25	0.26
330226	***Park Ridge Hospital***	Rochester	Monroe		0	0	0	0.18
Buffalo Consortium								
330219	Erie County Medical Center	Buffalo	Erie	Y	386	156	0.40	0.12
330005	Buffalo General Hospital	Buffalo	Erie		607	139	0.23	0.23
330118	Millard Fillmore Hospital	Buffalo	Erie		588	111	0.19	0.21
330078	Sisters Of Charity Hospital	Buffalo	Erie		401	33	0.08	0.12
330279	Mercy Hospital	Buffalo	Erie		319	27	0.08	0.35
330065	Niagara Falls Memorial Med	Niagara Falls	Niagara		222	12	0.06	0.18
330354	Roswell Park Cancer Institute	Buffalo	Erie		NA	NA	NA	NA
333300	Children's Hospital of Buffalo	Buffalo	Erie		NA	NA	NA	NA

NOTES:

Hospitals that withdrew from the demo as of date of design report 3/10/99. (Shown in bold)

1 Brooklyn and Queens Hospital Centers are continuing in the demonstration as individual applicants Representatives from both hospitals are currently negotiating with HCFA to change their glide path

2. Zeros indicate that Park Ridge had no residents at this time

3. Cells marked NA are PPS exempt hospitals Therefore data is not present in the Provider Specific file

4 Two of NY's teaching hospitals are not included in the statistics presented in Table 2-2 because they are PPS-exempt facilities Roswell Park Cancer Institute and Childrens' Hospital in Buffalo. According to information in HCFA's Provider Specific Files, Park Ridge Hospital in Rochester does not have residents even though it is (was) a demonstration participant – thus, it is not included in Table 2-2 either

SOURCE: Medicare Provider Specific File 1997.

Table 2-2

Characteristics of NY Teaching Hospitals by GME Demo Status

		Mean IRB Ratio		Mean 1996	Medicaid Inpatient Day Share 1996		
	Hospitals	1996	1997	Residents	Mean	Low	High
All Observations	**105**	**0.28**	**0.29**	**145**	**0.19**	**0.01**	**0.80**
Non-Participating Hospitals	59	0.19	0.20	75	0.15	0.01	0.80
Participating Hospitals	46	0.38	0.40	236	0.37	0.06	0.73
Withdrew From Demo	25	0.42	0.44	285	0.32	0.06	0.64
Still in Demo	21	0.34	0.35	178	0.46	0.12	0.73
New York City	**53**	**0.37**	**0.39**	**215**	**0.32**	**0.06**	**0.80**
Non-Participating Hospitals	21	0.26	0.28	99	0.27	0.07	0.80
Participating Hospitals	32	0.44	0.46	291	0.42	0.06	0.73
Withdrew From Demo	18	0.45	0.48	339	0.35	0.06	0.64
Still in Demo	14	0.43	0.44	230	0.56	0.16	0.73
NYC Suburban Ring	**24**	**0.17**	**0.18**	**74**	**0.09**	**0.01**	**0.50**
Non-Participating Hospitals	21	0.15	0.16	69	0.08	0.01	0.50
Participating Hospitals	3	0.28	0.31	106	0.27	0.20	0.32
Withdrew From Demo	2	0.35	0.36	145	0.28	0.20	0.32
Still in Demo	1	0.15	0.22	29	0.22	0.22	0.22
Upstate	**28**	**0.19**	**0.19**	**75**	**0.16**	**0.01**	**0.66**
Non-Participating Hospitals	17	0.16	0.15	53	0.15	0.01	0.66
Participating Hospitals	11	0.24	0.26	110	0.18	0.12	0.35
Withdrew From Demo	5	0.33	0.35	146	0.16	0.13	0.26
Still in Demo	6	0.17	0.18	80	0.20	0.12	0.35
Academic Medical Centers	**12**	**0.58**	**0.60**	**416**	**0.29**	**0.06**	**0.64**
Non-Participating Hospitals	3	0.66	0.65	282	0.22	0.21	0.22
Participating Hospitals	9	0.55	0.59	461	0.30	0.06	0.64
Withdrew From Demo	8	0.57	0.61	499	0.29	0.06	0.64
Still in Demo	1	0.40	0.42	156	0.35	0.35	0.35

NOTES:
1) IRB Ratio and Resident Means are unweighted
2) Includes Phase I and II participants, excluding 3 PPS-exempt upstate facilities.

28 upstate teaching hospitals, or 39 percent chose to participate. This geographic variation indicates that initial demonstration participants were disproportionately located in New York City. The demonstration also attracted a large proportion of the state's Academic Medical Centers. Among the state's 12 AMCs, 9 or 75 percent chose to participate in the demonstration.

Additional figures highlight some fundamental differences between participating and non-participating hospitals across the three geographic regions. In 1997, demonstration hospitals had twice the IRB ratio of non-participating hospitals. While this ratio varies slightly by region, the pattern of higher average IRB ratios among participating hospitals is consistent across these regions. In addition, the mean number of FTE residents in participating hospitals is three times higher than in non-participants. However, this disparity in the mean number of residents varies across the three regions. While New York City demonstration hospitals have three times the mean number of residents as non-participants, the Suburban Ring and Upstate regions show a smaller disparity. Within these areas, demonstration hospitals have about twice the mean number of residents as non-participating hospitals.

Overall higher IRB and mean resident figures for demonstration hospitals show that these hospitals, on average, had significantly larger residency programs than non-participants when they joined the demonstration. Among the three regions, New York City trained a significantly higher number of residents, comprising more than half of the residents in the demonstration. Together these figures indicate that the demonstration appealed most to urban hospitals with larger than average residency programs.

Another set of figures also provides some meaningful comparisons of teaching hospitals. The mean Medicaid Inpatient Day Share (MIDS) can serve a dual purpose: It can serve as a proxy for the amount of uncompensated care a facility provides; and at very high levels, it may also indicate a hospital's limited dependence on Medicare funding. According to 1996 figures, the mean Medicaid share for participating hospitals was .37, or about 2.5 times higher than the .15 figure for all non-participating hospitals, indicating a demonstrably

higher dependence on Medicaid funding among participating hospitals. However, this figure varies for participants by region. In New York City, the mean MIDS was .42 for participating hospitals and .27 for non-participants, showing a significantly higher dependence on Medicaid among participants. Similarly, the mean MIDS figure for participating hospitals in the Suburban ring were .27 versus .08, respectively. In contrast, the mean MIDS for upstate participating and non-participating hospitals was virtually the same. Clearly, these figures show that the relationship between Medicaid dependence and participation is complex and worthy of further examination.

The range of Medicaid dependence varies widely-from 1 and 80 percent for non-participants and from 6 to 73 percent for participants. Thus, while participants likely were influenced, in part, to participate in HCFA's Medicare demonstration when Medicaid-dependent, the influence was not always the dominant factor. Clearly, some very low Medicaid-dependent hospitals chose to participate while, conversely, some very Medicaid-dependent hospitals chose not to participate. The evaluation will continue to examine this issue and its relevance to the demonstration.

As of April 1999, 26 hospitals, including three consortia, have withdrawn from the program. Three metropolitan hospitals and the Rochester Consortium withdrew within the first 6 months of their entry into the demonstration. The withdrawal of Rochester left the Buffalo Consortium as the only upstate representative in the demonstration. The number of withdrawals has increased each year, with 6 in 1998 and 9 during the second quarter of FY 1999, including two consortia. Two hospitals that were originally participating as part of the Mt. Sinai and NYU consortia, Brooklyn Hospital Center, and Queens Hospital Center, wish to remain in the demonstration. They are currently in negotiations with HCFA to retain the 20% reduction targets associated with their respective consortia. Presently, 24 hospitals, or less than half the original participants, remain in the demonstration. Among those remaining, one recently announced its withdrawal in June of 1999. Considering the large proportion of recent withdrawals from the demonstration, it is important to briefly discuss the characteristics of the hospitals which have chosen to withdraw.

2.3.2 Characteristics of Withdrawals

While hospitals with larger residency programs were more inclined to participate initially in the demonstration, recent withdrawals run counter to this pattern. Recent evidence indicates that hospitals with larger residency programs were also more likely to leave the demonstration. For instance, in New York City, dropouts had an IRB ratio of .48 compared to .44 for the remaining hospitals. Withdrawals also averaged 109 more residents than those remaining in the demonstration. In the suburban ring, the same pattern emerged. The only remaining suburban hospital has only 29 residents. In the upstate region, both the mean IRB and number of residents dropped by almost half due to withdrawals. Among AMCs, this trend is especially apparent. Of the 8 original AMC participants, only 1 remains, with an IRB of .42 and mean resident count of 156, compared to former numbers of .61 and 499, respectively.

Exhibit 2-1

Characteristics of the NY GME Demo and BBA Section 4626 (Other than the Applicable Hold Harmless Percentages)

Provision	BBA Section 4626		NY GME Demonstration
Base Number of Residents Defined	FTEs (before application of weighting factors) in most recent training year ending before 6/30/97		
(v) Entities that increase primary care residents	1. Base FTEs < 750 or joint applicants 2. increase the number of primary care FTEs by at least 20%		increase proportion (share) of primary care residents by at least 20%
Duration	Not more than 5 years		Phase I: 6 years Phase II: 5 years
Residency Reduction Requirements			
Applicant	Base Number of FTEs	Minimum Reduction	Minimum Reduction Target
Individual hospitals	≥ 750	20%	25% or, while maintaining primary care share at base year, the greater of 150 residents or 20%
	600 - 750	150 FTEs	
	≤ 600	25%	
	qualifying (v) entities	20%	20% for qualifying (v) entities
Joint Applicants		25%	25% while maintaining primary care share at base year
	qualifying (v) entities	20%	20% for qualifying (v) entities
Consortia		20%	20% while maintaining primary care share at base year

3 Proposed Evaluation Quasi-Experimental Design

3.1 Overview

The main purpose of this chapter is to describe the overarching evaluation design for the components of the New York Graduate Medical Education (GME) demonstration and the BBA's GME-related provisions most amenable to a pre/post quantitative analysis. There are several approaches to evaluating social experiments (demonstrations). Which one to use depends on numerous factors, including the outcomes being evaluated, the complexity of events "within and outside" the demonstration, and the availability of data (Campbell and Stanley, 1963). Some designs are much "stronger" than others with the Random Clinical Trial (RCT) strongest of all. Social experiments such as the voluntary GME resident reduction demonstration and program do not permit randomization of participants, nor do they have simple, unidimensional outcomes. Indeed, different outcomes of interest will require different designs. Proposed analyses rely, more or less, on the preferred pre/post study/control quasi-experimental design outlined in this chapter.

The chapter is presented in five substantive sections In Section 3.2, we list then discuss the challenges involved in evaluating the NY GME Demonstration and BBA's GME-related provisions – especially the voluntary resident-reduction program (BBA Section 4626). In Section 3.3 we briefly summarize our proposed solutions to the evaluation challenges. In Section 3.4 we present the quasi-experimental design that we believe is best suited for the evaluation, noting its limitations in Section 3.5. Finally, in Section 3.6, we present criteria for specifying, then selecting, control groups for the NY GME demonstration and the BBA's voluntary resident-reduction program. The proposed control groups in this last section are referenced in subsequent chapters as appropriate.

3.2 Challenges in Evaluating the NY GME Demonstration and BBA's GME-Related Provisions

The two novel changes in the way medical education will be paid for in New York and the rest of the country involving GME payment reductions present four formidable challenges to the evaluation. They are:

- Confounding changes in other factors influencing medical education;
- A multi-faceted, overlapping set of interventions;
- Participated bias in the demonstration sites; and
- Limitations in data availability.

3.2.1 Confounding Influences

Any evaluation has the general goal of isolating the impacts of the intervention and providing quantitative estimates of effect sizes. With respect to the New York and BBA policy changes, the challenge comes in separating out the changes in the number and mix of residents, among other outcome measures, due to the interventions from other public and private trends that might reinforce, or hinder, such changes. In other words: How much of the change in the impact variable of interest was due to the intervention and how much to other factors? The answer depends, in turn, on answering two other questions. First, what other factors might be important in explaining a change in, say, residents being trained? And second, were any of the important factors changing during the time the intervention was taking place?

The answer to the first question requires a conceptual understanding of teaching hospital derived demand for residents. Such a model points to demand, supply, institutional preferences, and regulatory factors that theoretically impinge upon the recruitment and use of residents. The model, described in Appendix A, places emphasis on demand-side factors (including GME reductions) affecting the financial return to resident training, as well as institutional and medical school preferences for teaching.

As to the change in key confounding factors, the question is not strictly whether a change occurred during the time of the intervention. Rarely is a change abrupt. The problem is subtler and involves lags in responses. Longer run changes in underlying factors affecting teaching hospitals have likely set trends in resident demand in motion.

3.2.2 Multifaceted, Overlapping Interventions

Separating out all the overlapping New York and BBA interventions will be challenging. In fact, we see no viable way of separating out and quantifying all elements of both interventions--especially ascribing causality as distinct from simple measures of change in variables of interest.

In particular, is it possible to quantify the independent effects of the terms and conditions of the NY resident reduction demonstration from the overarching BBA rollbacks in IME and DME, among other things? More to the point, does it make any material difference what the voluntary transition payment program accomplished distinct from BBA mandatory effects?

We think it does. If teaching hospitals substantially reduced residents simply due to the financial incentives embodied in the mandatory BBA payment changes, then no transition payment program would be required. If, on the other hand, teaching hospitals barely responded to the IME and DME payment reductions, then the marginal effectiveness of a transition payment program in downsizing is key.

3.2.3 Participation Selection Bias

The confounding effect of selection bias due to voluntary participation in any demonstration cannot be overemphasized. The most important policy question for the demonstration is whether the transition payments encouraged facilities to reduce their complements of residents over-and-above what they would have done without the payments. If the answer is no, then any observed changes in outcomes (e.g., reduced access) must be due to factors other than the demonstration incentives to downsize.

Selection bias concerns a differential response to incentives and external changes among individual providers. If participating providers view the reduction in residents in more sanguine terms than other teaching hospitals, or if they find it easier to accomplish for some reason, then the evaluator cannot generalize the size of any estimated participation effects to other teaching hospitals more generally. An overestimate, or bias, in the predicted impact of transition payments would be the result. The challenge is to derive an quantitative estimate of the selection bias effect, if any, or at least a qualitative notion of its presence and nature.

3.2.4 Limited Data

The best solution to all three challenges is data. A longer time series helps avoid underestimating changes that lag several years after the beginning of the intervention. A longer pre-series also helps develop a statistical trend line that can be used to benchmark post-intervention changes. Whether a long enough pre-series can be constructed is an open question, but it is clear that the longer run impacts of the New York and BBA interventions cannot be fully measured by the end of the evaluation period.

Another data limitation concerns the unobserved organizational and institutional factors that influence a hospital's decision to participate in the New York transition payments demonstration or the BBA voluntary resident reduction program and that facilitate or constrain a provider's ability to reduce the number of residents. No secondary data source exists for these unobservables.

3.3 Proposed Solutions

There is no perfect solution to all of these problems. However, several methods do address the concerns as best as possible. They include:

- Constructing a panel of study and control hospitals matched on key hospital and market characteristics;
- Collecting several years of resident, institutional, and market data prior to the start of the New York and national BBA changes;

- Applying multivariate statistical techniques that address confounding variables, multiple interventions with interactions, and selection bias;
- Developing and estimating a participation model for both the New York GME demonstration and BBA voluntary resident-reduction program; and
- Conducting numerous case study interviews in selected participating and control hospitals to further identify factors affecting participation and willingness to reduce resident counts.

The panel time series data base will support multivariate analysis of the time trend in resident counts, resident and case mix change, etc., adjusting for a pre-period trend, if any, and testing for differential effects in participating versus non-participating teaching hospitals. The participation modeling will specifically address measurable differences between those who volunteer for the transition payments and other teaching hospitals. Finally, the in-depth case studies in both participating and non-participating teaching hospitals will be used to describe unmeasured differences between the two groups.

3.4 Quasi-Experimental Design

In this section, basic quasi-experimental design strategies are discussed, and our recommended analytical approaches are described for both the NY GME demonstration and the BBA's voluntary resident reduction program (S4626).

3.4.1 Basic Design Concepts and Criteria

Our analytical approach is, in the first instance, based upon a classic pre/post quasi-experimental design. The basic "differences-of-differences" design can be illustrated by the following diagram.

Group	Time Period 0	Time Period 1	Difference
Experimental	$\overline{y}_o^d$	$\overline{y}_1^d$	$\overline{y}_1^d - \overline{y}_0^d$
Control	$\overline{y}_0^c$	$\overline{y}_1^c$	$\overline{y}_1^c - \overline{y}_0^c$

The *d* and *c* superscripts denote, respectively, experimental and control groups while the 0 and 1 subscripts denote, respectively, time periods 0 (pre or base period) and 1 (post period).

Analyses based on this design typically measure an outcome of interest (e.g., the number of FTE residents) both before the start of a demonstration (program or intervention) or the effective date of new legislation (the pre period) and during a subsequent period (the post period) for both an experimental group (e.g., demonstration participants) and a control group (e.g., non-participants) as illustrated below. As illustrated above, the mean of an outcome (e.g., the number of FTE residents), $\overline{y}$, is determined for the pre period and for the post period for both the experimental group (e.g., hospitals participating in the NY GME demonstration) and the control group (e.g., New York teaching hospitals not participating in the NY GME demonstration). The effect of the demonstration is not merely the difference between the mean number of FTE residents in the pre and post periods for the experimental group ($\overline{y}_1^d - \overline{y}_0^d$) because other events, including basic trends, might occur that affect the number of residents over time. It is for this reason that a control group is necessary. To arrive at the true demonstration effect, it is necessary to subtract from the experimental group's pre/post difference the change in the number residents "common" to both groups (e.g., time trends), which, under *ideal* circumstances, is simply the control group's pre/post difference, ($\overline{y}_1^c - \overline{y}_0^c$). In other words, the demonstration effect is the difference of the two differences: $(\overline{y}_1^d - \overline{y}_0^d) - (\overline{y}_1^c - \overline{y}_0^c)$.

3.4.2 Interrupted Times Series (Panel) Design

While our basic approach is based on a pre/post design, for our actual analytical work a variant of the pre/post design will be used – the interrupted (multiple) time series. This approach takes advantage of more than one period of data for both the pre and post "intervention" periods for multiple groups. Alternative names for this design include *time-series cross-section* and *panel* designs. Aside from having more than one year of pre and post data, there are three major reasons for adopting a panel design. First, the transition percentages for the NY GME demonstration and BBA's voluntary resident-reduction program are reduced each year for a period of five to six years time and the "multiplier factor" in the IME adjustment formula is reduced over a five-year period. Second, there might be lagged responses to PPS changes (e.g., a ceiling on the number of FTE residents), and the number of FTE residents might not immediately decrease in a response to a change in payment. And third, no control group can be perfectly (or randomly) matched on the unique environmental characteristics of study participants.

3.5 Limitations to Design

Not all of the policy issues are amenable to analysis using a pre/post design. For instance, questions regarding the locus of decision making on whether to participate in a resident reduction program are not suited to a pre/post design. Another such example is the BBA's resident ceiling (cap) – a comparison of "simulated" residents to actual residents is called for (see Chapter 5).

Then there are some issues that cannot be fully analyzed using a pre/post design because of data limitations. The BBA's voluntary resident-reduction program has yet to commence. Since the evaluation contract will end prior to the maximum five-year duration of the program, data for the final years of the program and the post-program period will not be available for analysis. Even the evaluation of the NY GME demonstration will be hampered by a lack of data (e.g., hospital volume) for the final year and the post-demonstration period. Data on access and quality may also be lacking in the pre period or

for the control group more generally, hampering the analysis. Nevertheless, all reasonable attempts will be made to apply the interrupted time series design in answering the many questions posed by HCFA staff in the RFP.

3.6 New York and BBA Program Control Groups

The voluntary nature of the NY GME demonstration (BBA's voluntary resident-reduction program) and the other contemporaneous BBA and environmental (e.g., managed care pressure) changes do not seem to allow for the specification of an ideal control group. In the first instance, it is quite likely that the hospital participation decision process cannot be characterized as random, in which case, any control group will automatically differ in key ways from participants. Further, it will be nearly impossible to identify and quantify all environmental elements that might influence the behavior of demonstration and potential control sites. With these caveats in mind, let us present the criteria for selecting the best possible control group for the New York and S4626 resident reduction initiatives.

3.6.1 Criteria

The choice of a control group must take into consideration the characteristics of both the participating and the non-participating hospitals. Assuming that non-participating hospitals with characteristics similar to the participating hospitals can be found, the question is how to form the control group. At one extreme, each of the participating hospitals could be matched to a hospital with similar characteristics. There are several problems with this approach that argue against it, the most notable of which is finding a hospital(s) with similar characteristics for each of the participating hospitals.

Instead of assigning one matched hospital to each of the participating hospitals, we propose *selecting a group of hospitals* as the control group that, overall, has characteristics similar to the participating hospitals (as a group). Even though this approach is also subject to the problem of specifying the characteristics for matching, the great strength of a sample of control hospitals is the averaging out of unobserved characteristics.

We describe, in turn, selection methods for a sample of control hospitals for the NY GME demonstration and the BBA voluntary resident reduction program.

3.6.2 Proposed NY GME Demonstration Control Groups

We recommend two control groups for the New York demonstration: (1) all non-participating teaching hospitals in New York; (2) and a geographically matched sample of teaching hospitals outside New York.

New York Teaching Hospitals. A natural choice for the control group would be those New York teaching hospitals that declined to participate in the demonstration. Of the 105 New York hospitals with residency programs, 46 (ignoring three PPS-exempt facilities) initially decided to participate (as shown in Table 2-2). Demonstration participants are disproportionately in New York City, are more Medicaid dependent, and are (were) Academic Medical Centers (AMCs). All but one AMC has withdrawn. Non-participating NY hospitals are disproportionately suburban and upstate hospitals.

Despite the fact that the non-participating New York teaching hospitals are not entirely similar to the participants, we still recommend that they be used as the primary control group for two reasons. First, multivariate statistical techniques exist to control for self-selection.[1] Second, all New York teaching hospitals are subject to several unique environmental influences, including GME private payer roll-backs and limits on resident work hours. Any hospital control group outside New York may face quite different incentives and constraints in downsizing their residency programs.

Outside New York Teaching Hospitals. Alternative control groups will be selected among teaching hospitals from very large urban areas with the same range of socio-economic characteristics and problems as New York City. While it is well-known that the Bronx has a very high poverty rate, most, if not all, of the other boroughs also have large pockets of poverty. Iglehart (1998) observed that NYC hospitals relied on residents to provide medical care to the poor, and it is likely that voluntary hospitals in other very large U.S. cities also

[1] These techniques will be further discussed in Section 4.5 and Appendix C2.

rely on residents to provide medical care to the indigent. Cities that will be considered include Philadelphia, Baltimore, Detroit, Chicago, St. Louis, New Orleans, and Houston--all of which have large concentrations of urban poor.

The other major metropolitan area in New York with demonstration participants is Buffalo. (We will not treat Rochester hospitals as participants given their short tenure; hence, they will not require a control group.) Cities of a similar size and economy include Dayton, Providence, and Hartford. At this time, we do not know whether the teaching hospitals in these cities have a similar relationship to a dominant medical school as in Buffalo.

The final selection of non-New York hospitals as controls will be made early in the evaluation phase using AHA and Census data.

3.6.3 Proposed BBA Voluntary Resident Reduction Program (Section 4626) Control Groups

Since HCFA has yet to solicit participation in the BBA Section 4626 program, the types of hospitals that might participate are not known. It is not clear that the BBA voluntary participants, if any, will resemble New York participants.

Lacking specifics regarding participants, we anticipate using two control groups. The first will be all non-participating teaching hospitals in the U.S. (excluding those in New York) with statistical adjustments for market and facility differences. The second type of control group would be based on non-participating hospitals from selected metropolitan areas. Two variants of this second type are: (1) Non-participating teaching hospitals from the same area as participants; or (2) Non-participating hospitals from metropolitan areas similar to but not identical to those where participating hospitals are located.

Two control groups will be selected once the characteristics of S4626 participants are known.

4 Analyses of Changes in Residents and Participation in Voluntary Reduction Initiatives

4.1 Overview

This chapter provides an evaluation design for two broad areas of hospital response to the New York GME demonstration and the national BBA voluntary resident reduction program.

1. Participation in resident reduction transition payment programs.
2. Changes in the level and mix of residents & programs.

The structure of the New York GME demonstration and BBA resident reduction program was described in Chapter 2. Both provide very similar incentives to downsize resident programs; hence, the reason for treating the two initiatives in this chapter under a single, overarching methodology. A quasi-experimental design is employed as described in the previous chapter. Control groups proposed for the evaluation of changes in residents are also described in Chapter 3. Besides the two resident downsizing programs, the BBA also has several mandatory changes that might affect the growth in residents everywhere. The evaluation design for these programmatic changes can be found in Chapter 5.

The chapter is organized into 4 substantive sections. Section 4.2 summarizes the policy questions appearing in HCFA's RFP relevant to downsizing residency programs. Section 4.3 presents our proposed tabular analyses of changes in residents and voluntary program participation. Section 4.4 presents our proposed multivariate analyses. (Appendix C provides more technical material on the econometric techniques proposed to this chapter.) Section 4.5 concludes with our plans for conducting qualitative analyses based on personal interviews.

4.2 Key Policy Questions

The policy questions addressed in this chapter are organized in an identical manner as they appeared in Appendix J, sections C and D, of HCFA's RFP. Most of the analytic questions appear in J-1C on the New York GME demonstration and apply as well to the BBA voluntary reduction program. A few additional questions pertain to BBA Section 4626.

BBA 4626: Incentive Plans for Voluntary Reduction in Number of Residents

1. How many hospitals from how many states applied under the voluntary reduction program? Were any applications rejected? Why? (RFP Appendix J-1D)

2. How many residents did the awardees represent in the base year? What is their expected reduction by the 5th year? (J-1D)

3. Which specialties have they targeted for reduction? How were the number of primary care residents effected? (J-1D)

4. How do these numbers compare with those from the NY demo? Also, see the first 11 sets of questions about the NY demo. (J-1D)

New York GME Payment Demonstration

5. Did the demonstration sites meet their targets for reducing the size of their physician residency program? Did any exceed their goals? How many were not successful in achieving their goals? (RFP Appendix J-1C)

6. What were the apparent reasons? (J-1C)

7. How do the characteristics of successful and unsuccessful sites compare? (J-1C)

8. Were the reductions achieved by the demonstration sites sufficient to reduce the state-wide size of physician residency training? (J-1C)

9. Are there signs or evidence that the size of residency training programs in other states, especially adjacent states, grew during the demonstration period? (J-1C)

10. How did the characteristics (age, sex, race, origin, specialty, etc.) of the residents in the demonstration sites change from year zero to year five overall? In successful sites? In unsuccessful sites? (J-1C)

11. What criteria did participating institutions apply in implementing the downsizing of their residency programs? (J-1C)

12. Were there significant differences in such criteria according to hospital mission, type or training program size? (J-1C)

13. Was the size of primary care residency training in the demonstration sites affected? (J-1C)

14. What were the changes in actual IRB ratios in the demonstration sites? How do these compare with those of similar teaching hospitals elsewhere in New York and in the nation? (J-1C)

15. Did the success/failure rate of consortia differ from those of individual sites?
(J-1C)

16. What are the characteristics of the institutions that apparently benefitted more from participation in a consortium than they would have as an individual site?
(J-1C)

17. Did any demonstration sites totally abandon their residency programs? (J-1C)

18. Did any sites abandon their residency programs for particular specialties (and which ones)? (J-1C)

19. Did any organizations withdraw from the demonstration, and why did they withdraw? (J-1C)

20. Did demonstration sites develop more extensive non-physician training programs than are found in teaching hospitals elsewhere? (J-1C)

21. Was there an impact on the size of the dental training programs of the participating institutions or in the volumes of dental health care they provide?
(J-1C)

22. Is there any evidence that suggests the changes in the sizes of the residency training programs at the demonstration sites were greater than those that occurred elsewhere (or would have occurred anyway in the absence of the demonstration)? (J-1C)

4.3 Changes in Level and Mix of Residents and Programs

4.3.1 Tabular Analyses

The tabular analyses will involve collecting annual data on the number of first-year and other-year residents for each hospital. They will be decomposed by specialty type as well. One table will show the total number of first year and all residents for demonstration participants versus nonparticipating teaching hospitals in the control group for each evaluation year plus a couple of years prior to the demonstration. The demonstration hospitals will be further decomposed into those that remained in the demonstration for the entire period and those that withdrew (e.g., Exhibit 4-1). How often this table will be produced will be decided once the scheduling of deliverables is agreed upon with HCFA. The percent change in each time series will be compared in a simple test of whether demonstration hospitals made greater reductions their resident counts. Tables for the NY GME demonstration will not need statistical tests of differences if the control group is non-participating New York teaching hospitals because all New York teaching hospitals will be in the sample and the results won't be generalized to the rest of the country. Statistical tests will be necessary for the BBA "demonstration" even if the control group includes all non-participating U.S. teaching hospitals because the data will be limited to a specific period of time.[1] A second table will present the two time trends decomposed by specialty with similar percent change comparisons. A third table will present time trends for the ratio of primary care to other specialty residents by participation and withdrawal status. (Also see Appendix B for a discussion of the specialties the sites originally targeted for reduction.) A fourth table

[1] For ease of exposition, the term *demonstration* is used, hereafter in this chapter, to denote both the NY GME demonstration and the BBA's voluntary resident-reduction program.

Exhibit 4-1

Number of Full-Time Equivalent Residents by Demonstration Status

"Demo" Year Beginning	First-Year Residents				Total Residents			
		Demonstration Participants				Demonstration Participants		
	Control	Total	Stayed in	Withdrew	Control	Total	Stayed in	Withdrew
1994								
1995								
1996								
1997								
1998								
1999								
2000								
2001								
2002								
2003								
2004								
2005								

NOTE: Demonstration years are bolded and italicized.

will present similar trends for the IRB ratio. First-year versus all-resident counts will be shown on all tables to test the hypothesis that first-year residencies will decline the most.

Trends in resident counts will be displayed by hospital characteristic by demonstration versus control hospital. Important stratifying variables will include (among others): hospital size, IRB ratios, type of teaching hospital (COTH, AMC, other), geographic location (e.g., New York City, urban/rural, etc.), applicant type (i.e., individual, joint, or consortia), and ownership. Resident counts in demonstration versus control hospitals will also be decomposed by race and IMG status and percent changes by group compared.

Using application data submitted to the HCFA project officers overseeing the two resident-reduction initiatives, we will tabulate the number of applicants by state. We will also tabulate, by state, the rejected applicants and, to the extent possible, the reasons for rejection (also see Section 4.5). The average number of residents represented by the awardees in the base year and the average expected 5-year reduction will be calculated by state.

In comparing characteristics of "successful" versus "unsuccessful" sites, success will be defined two ways:

(1) Participants will be considered "successful" if they meet their original cumulative reduction targets while "unsuccessful" sites include continuous participants failing to meet their cumulative targets ; or

(2) "Unsuccessful" sites will include both participants failing to meet their targets and all withdrawals (including any Phase II hospitals).

The number of participating hospitals meeting their reduction targets, falling short of the targets, and exceeding the targets will be tabulated by demonstration year and cumulatively. We will similarly tabulate the number of participating hospitals by target attainment status by hospital characteristic (e.g., applicant type [individual applicant, joint applicant, and consortia member]). We will also display other characteristics (e.g., baseline size of total residency programs) of applicant types by their target attainment status. For all tabular results, data permitting, comparisons between the New York and BBA downsizing initiative will be performed.

Using IRIS data, we will calculate the number of residents in non-participating hospitals in New York and all teaching hospitals in adjacent states, by demonstration year, to determine whether the overall number of residents changes as a consequence of the NY GME demonstration. A similar tabulation will be performed for the BBA resident-reduction program. Note, however, that given the BBA ceiling on residents, we generally do not expect that the total number of residents will increase in non-participating hospitals. The only legal way that the total number of residents in non-participating hospitals can increase is through BBA Section 4623's special rules for new facilities (programs) and facilities serving under-served areas.

4.3.2 NY Demonstration & BBA Program Participation

We have already prepared a set of preliminary tables on the characteristics of hospitals that participated in the New York demonstration (see Tables 2-1 and 2-2). Key variables already tabulated include:

- AMC status;
- Bedsize;
- Total resident FTEs;
- IRB ratio; and
- Medicaid share of inpatient days.

We propose supplementing the list based on the participation model briefly described in Section 4.4 below that justifies inclusion of certain variables. Variables would include:

- **Volume**:
  - Change in inpatient discharges prior to entering demonstration;
  - Residents per Average Daily Census;
  - Beds per capita in local market;
  - Level and change in HMO penetration rate in local market;
- **Program:**
  - IMG percent of residents;

- Match rate for USMGs;
- Number of specialty programs;
- Number of programs with less than 6 residents;
- Ratio of primary care to specialty residents;

- **Affiliation:**
  - Membership in GME consortium;
  - Recent change in consortium membership;
  - Recent merger with another hospital;
  - Change in out-rotations as percent of residents;
- **Payer:**
  - Percent of inpatient revenues from Medicare and Medicaid;
  - Percent of uncompensated care of total patient revenues;
- **Substitute:**
  - Ratio of primary care residents to nurses;
  - Ratio of primary care residents to staff attendings;
  - Percent of salaried versus fee-for-service staff attendings.

These variables would be presented in a set of tables similar to Table 2-1 above, organized by domain (e.g., volume, affiliation). For New York, we recommend continuing to group hospitals, first, into upstate versus downstate, then by individual/joint versus consortium participation status. Because the BBA voluntary reduction program has not identified participants yet, it is premature to specify the exact grouping of participants. Likely, we would want to group participants by city and rural areas.

We would also generate a set of additional tables similar to Table 2-2. These tables provide averages for each of the key characteristics by location and participation/withdrawal status. T-tests of significant differences would suggest possible participation bias, first, with respect to the control group, and second, surviving participants with respect to withdrawals.

These tables would also provide HCFA with valuable summaries of key characteristics of hospitals seeking transition payments to support downsizing (e.g., percent uncompensated care, specialty orientation of programs).

4.4 Multivariate Analyses

We will use the quasi-experimental design in a multivariate econometric mode to more rigorously test some of the tabular results. This approach is designed to adjust, statistically, for trends in confounding variables and possible participation selection bias inherent in any voluntary demonstration. Regression methods will produce estimates of the average effect of confounding variables on resident trends that, when subtracted out, leave a pure statistical comparison of demonstration versus non-demonstration time trends.

First, we present our general multivariate estimation model. We then follow with our econometric plans for analyzing participation bias, a necessary step to derive unbiased estimates of the unique impact of transition payments on resident downsizing.

4.4.1 Changes in Resident Levels and Mix

To address changes in the level and mix of residents, regressions will be specified in which the number of full-time equivalent (FTE) residents and the ratio of primary care to total residents will be the primary dependent variables. Two basic regression models will be estimated. The first regression model will be a pre/post single difference model. The dependent variable will simply indicate the total change in residents between the baseline and end of the demonstration period. The second regression model will utilize a time-series cross-section (panel) of observations. Unlike the first model, the second model can be used to detect the demonstration effect in each of the demonstration years and, if it were possible to obtain enough post-demonstration data, period-specific lagged demonstration effects.

Pre/Post Difference Model. This model will take the form of:

$$(4\text{-}1) \qquad \%\Delta FTERES_{2004\text{-}1996,i} = f(\%\Delta X_{2004\text{-}1996,i}, \%\Delta W_{2004\text{-}1996}, D_i)$$

where $\%\Delta FTERES_{2004\text{-}1996,i}$ is the percentage change in the number of full-time equivalent (FTE) residents between 2004 (the last NY GME demonstration year) and 1996 (the last year prior to the NY GME demonstration) in hospital i, $\%\Delta X_{2004\text{-}1996,i}$ is the percentage change in factors affecting hospital i's employment of residents between 1996 and 2004, $\%\Delta W$ represents BBA-mandated changes in Medicare PPS reimbursement policy (e.g., percentage change in the IME payment rate) between 1996 and 2004, and D_i indicates whether hospital i is a demonstration participant or in the control group.

The basic explanatory variables, X, are modeled as changes instead of levels. Thus, instead of using the level of output (volume) and the casemix values, for instance, the variables are measured as the change in output and the change in casemix. This formulation also has the effect of eliminating fixed (time-invariant) attributes from the equation such as location and ownership. Unmeasured fixed attributes such as managerial capacity that may be correlated with *levels* of the other explanatory variables, are also eliminated.[2] (See the next section for a fuller discussion of the X and W variables).

The coefficient on D measures the impact of the demonstration. A negative value of D's coefficient would indicate a larger percentage decrease in the number of residents in participating hospitals than in non-participating hospitals. In Equation 4-1, D measures the entire percentage change in residents due solely to the demonstration.

We will also introduce dummy variables representing fixed attributes such as ownership and teaching status into the model to capture their differential contribution, if any, to resident reduction. Interacting selected hospital characteristic dummies with participation status can be used to test for differential responses to transition payments by hospital type. Given the small number of remaining participants in the New York demonstration, it may not be possible to statistically decompose the impact of transition payments by hospital type.

[2] As Maddala (1977, 326) states, "The first-difference method is a drastic remedy for the effects of all time-invariant omitted variables."

Time-Series Cross-Section Panel Model. The basic evaluation panel equation will take the form of:

$$(4\text{-}2) \quad y_{i,t} = \sum_{k=1}^{K} \beta_k X_{i,t,k} + \sum_{t=1}^{T} \pi_t P_t + \delta D_{i,t} + \sum_{t=1}^{T} \gamma_t P_t D_{i,t} + \sum_{t=1}^{T} \rho_t P_t DP_{i,t} + \sum_{t=1}^{T} \omega W_t + \mu_{i,t} \quad i = 1,\ldots,N; \quad t = 1,\ldots,T$$

where $y_{i,t}$ represents the level of FTE residents (or the share primary care residents or other dependent variables) in period t for hospital i; X_k represents a vector of K variables that includes the factors that affect the derived demand for residents (relative prices of nurses and attending physicians, case mix, inpatient days); a series of binary variables, P_t, one for each of the time periods represented in the data set; a binary variable, $D_{i,t}$, representing a hospital's participation in the demonstration, and equal to one in all periods for demonstration hospitals; $P_t \cdot D_{i,t}$, an interaction term, is designed to capture deviations in the trend line between control and demonstration hospitals; $P_t \cdot DP_{i,t}$, an interaction that captures the demonstration effect with DP=1 for participating hospitals only during the demonstration; W_t represents concurrent BBA provisions that apply to GME reimbursement; and $\mu_{i,t}$ represents the error term which captures the effects of unknown factors. The coefficient, ρ, will test whether demonstration hospitals achieved a significant reduction in residents relative to both the control group of non-participants and their own resident trend line prior to the demonstration. The coefficient, π, indicates the average number of residents in control hospitals in each period while δ reflects the difference in the number of residents between control and participating hospitals. The coefficient, γ, further reflects any changes in the deviation of participating hospital residents from the control group over time. If the underlying time trend in residents was the same in participating and control hospitals, then γ would suffice as a measure of the effect of transition payments. However, if the underlying trend differs, then the additional interaction factor and ρ are needed.

Principal factors (other than transition payments) that influence the number of residents include:

- level of hospital output (e.g., inpatient days),
- case mix severity,
- Medicaid inpatient share (as a general proxy for poor patients), and
- wages of residents relative to the wages of occupational groups that are substitutes for residents.

Among the potential occupational groups that might be substitutes for residents, depending on the residency specialty, are registered nurses, nurse practitioners, physician assistants, nurse anesthetists, and attending physicians. Any hospital and market-specific practices or restrictions (e.g., union work rules) that might affect the substitutability, at least in the short run, of less highly-trained personnel for residents should be controlled for. To control for time trends and unmeasured confounding factors (e.g., changes in managed care such as the New York State 1115 waiver "The Partnership Plan"), binary variables representing each year of data will be included as regressors.

Other explanatory variables that might be included in the regression include organizational challenges to changing the number and/or mix of residents. For instance, a hospital with only four residency programs might find it easier (more difficult) than a hospital with 12 residency programs to reduce the number of residents. (See discussion of program variables in Section 4.4.2 for more examples.)

A problem in trying to capture the unique demonstration (or policy change) effects in $\hat{\rho}$ is that there are several other factors changing at the same time, most notably, the effects of the BBA provisions. In principle, BBA and other factors can be represented in Equation 4-2 as separate variables (W) and, in fact, we will do so. The problem is that, since the other BBA provisions take effect in nearly the same period as the demonstration, DP and W will be collinear. If, as likely, DP and W are extremely collinear, then Equation 4-2 cannot be estimated. By removing W from Equation 2, the effects of the other contemporaneous variables will be loaded on to the time period binary variables. To the extent that the time period variables can control for the BBA effects, $\hat{\gamma}$ and $\hat{\rho}$ represent the

reduction in residents in participating hospitals, first, prior to the demonstration, then during the demonstration.

In addition to the simultaneous effects of the BBA, there might be other contemporaneous changes that affect the number of FTE residents. For the NY demonstration, the state's highly regulatory NYPHRM system was recently abandoned, and certainly the turbulent, short-run effects of deregulation will continue for many years. Aside from the Medicare+Choice BBA provisions, increased managed care penetration, especially in New York, Philadelphia, Chicago, Houston, and Baltimore (that could form alternative control groups) will also affect residency programs. To the extent that these other changes cannot be adequately measured or suffer from collinearity with the time-determined NY participating binary variable, then $\hat{\gamma}$ and $\hat{\rho}$ will also reflect these effects as well even if hospitals outside of NY State are used as controls.

Even if contemporaneous events could be perfectly controlled for without the unfortunate side-effects of collinearity, biased selection remains a potentially serious problem affecting the interpretation of $\hat{\gamma}$ and $\hat{\rho}$. The problem of biased selection is discussed below.

Equation 4-2 usually cannot be estimated directly using ordinary least squares (OLS) because hospitals are heterogeneous in ways that are not always known to us. Latent unobserved factors (e.g., managerial efficiency) may account for different levels and trends in FTE residents. In pooled time-series cross-section estimation, variation in these "unknown" factors may result in heterogeneity bias. To address this potential bias we intend to estimate both fixed- and random-effects models. These models add flexibility in allowing for site-specific differences. (See Appendix C1 for an extended discussion of panel models.)

When estimating regressions, it is always important that the model be properly specified. In order for the estimated demonstration effects, γ and ρ in Equation 4-2, to be unbiased, it is important that variables that might be correlated with it be included as explanatory variables. Other than the BBA policy variable(s), the omission of hospital output (volume) as an explanatory variable is the one most likely to cause ρ to be biased -

probably too high (in absolute terms). Hospitals experiencing larger volume declines will likely want to reduce residents more and be more interested in receiving transition payments for downsizing. If hospital volume is not included as an explanatory variable, $\hat{\rho}$ will capture its effects and thus overstate the demonstration effect. The effect is known as the *omitted variable bias.*

Including hospital volume, however, introduces other estimation problems. Fewer residents may also mean less hospital volume. This circular set of relationships (i.e., volume affects desired demand for residents, residents affect level of patient care volume), if not properly controlled for, gives rise to endogeneity bias. If hospital output is truly influenced by the number of residents in patient care, then it is possible that its regression coefficient is biased and the random-effects technique should not be used to estimate Equation 4-2. We will estimate Equation 4-2 with and without hospital volume to test the sensitivity of the estimated imput of transition payments to any possible estimation bias.

4.4.2 Participation Bias

Hospital participation is of interest, both in its own right and because of the threats to validity that voluntary programs pose in interpreting the statistical results. Participation (or selection) bias can arise from (a) the initial decision to join the demonstration, and (b) from attrition (withdrawal). We describe how selection bias arises, how demonstration effects might be biased, and how we propose to obtain unbiased estimates of the demonstration effects. Finally, we propose two basic approaches we intend to use in treating hospitals that withdraw from the New York demonstration or BBA voluntary reduction program.

The Participation Bias Problem. The problem of selection bias occurs when, instead of random assignment to experimental and control groups, hospitals are allowed to choose whether to participate in the demonstration (join the experimental group) or remain as non-participants (and become the *de facto* control group). If the decision to join the demonstration is unrelated to the hospital's perceived success in reducing the number of

residents, then selection bias may not be a problem. It is almost certain, though, that hospitals expecting to downsize more will participate and that the demonstration effect of transition payments on residents will be overstated in Equation 4-2. When selection bias is present, it is essentially impossible to "select" an ideal control group. This is true in the case of the NY GME demonstration even if the control group is composed only of hospitals outside of New York because New York hospitals participating in the demonstration will still be more inclined to downsize.

Participation Model. In HER's original proposal, we developed a model explaining teaching hospitals' decision to enter the demonstration. At that time, very few participants had withdrawn. Now, as of the Spring, 1999, over 25 hospitals have dropped out. Given the uncertainty facing prospective participants three years ago and the high number of drop-outs, it no longer seems valuable to explain only an initial 0,1 participation decision. Clearly, many hospitals who decided to participate, upon further review and experience, realized that the large mandated resident reductions were not in their best overall economic or programmatic interests. At bottom, the initial decision is too "noisy," statistically, to have much meaning. By "noisy" we mean that factors logically influencing the participation choice will be only loosely correlated with the initial "rush to participate." [3]

We propose two alternative specifications of the participation decision to distinguish between transient and permanent applicants:

(1) defining participation as entering and remaining in the demonstration after June, 1999; versus
(2) defining participation in two parts as (a) ever entering, versus (b) entering and withdrawing by the end of the second year.

[3]Such noise is very much the issue beyond being "reflected in weaker/less significant coefficients," as one reviewer of the draft design report indicated. First, the random nature of initial participation likely presents a misleading picture of the kinds of hospitals likely to take advantage of transition payments when given more time to consider their decision. Second, the implication of essentially defining an "ever participant" as a participant (and accepting the "noise") is to bias towards zero any study-control differences. For example, HCFA would like to know whether hospitals experiencing volume declines are more likely to accept transition payments and downsize more. Unless the "noise" of initial participation is removed in some fashion, the true impact of volume changes may be masked. By differentiating between "surviving participants" and "withdrawals," we hope to reduce the noise, reduce the participation bias, and gain insights to the true participation process more generally.

Model (1) will attempt to explain why some hospitals entered and remained in the demonstration versus all those that never entered or entered but dropped out when they realized that the transition payments were inadequate to compensate for such large reductions in residents. Model (2) goes further and attempts to discriminate between entrants who remained and those who, according to our interviews, accomplished some desired reductions before dropping out.

The same set of explanatory variables will be used in both models as shown in the equation below:

(4-3) Pb(part) = f(Volume, Program, Affiliation, Payer, Substitute)

where Pb(part) = the probability of participating in the demonstration (fully or sporadically), is hypothesized to be a function of 5 vectors of different hospital characteristics.

Dependent Variables. Two dependent variables will be specified. In Model (1), part = 1 if the hospital entered and remained in the demonstration for more than 2 years; 0 otherwise. In Model (2), part = 1 if the hospital entered then withdrew before 2 years; =2 if remained in for more than 2 years; 0 otherwise.

Independent Variables. We have grouped the reasons for partial or full participation into five sets of variables derived from theory and case study interviews. (See Appendix B summarizing the case study responses to our participation questions gleaned from our initial site visits to Buffalo and New York City.)

- **Volume**: A set of variables characterizing changes in hospital inpatient volume, intensity of resident care per patient, and competitiveness of local market for patients. Examples include: (a) change in inpatient cases or days in two years prior to entering the demonstration; (b) residents per average daily census; (c) beds per capita in market; (d) HMO penetration rate.
- **Program**: A set of variables characterizing the quality, concentration, and orientation of the facility's resident training programs. Measures of "weak" programs include: (a) percent of IMGs in total resident count or among larger specialties; (b) historical fill rate of slots by USMGs; (c) extremely large primary care programs. Measures of unconcentrated, diffuse programs include: (a) number of different subspecialty programs;

(c) number of programs with fewer than 5 residents; (c) AMC status. Measures of primary care orientation include; (a) ratio of primary care to specialist residents; (b) ratio of primary care to subspecialist residents.

- **Affiliation**: A set of variables characterizing consortium, medical school affiliations, mergers, and resident rotations. Measures include: (a) whether hospital is a member of New York resident consortium; (b) whether hospital made a recent change in medical school affiliation; (c) whether hospital had merged with another local hospital; (d) any change in out-rotations as a percent of residents.
- **Payer**: A set of variables characterizing payer mix and dependence on Medicare and Medicaid. Measures include: (a) percent of inpatient revenues from Medicare; (b) percent of revenues from Medicaid and/or charity care.
- **Substitute**: A set of variables characterizing the necessity, ease and costliness of replacing residents with other personnel in patient care. Measures of necessity include: (a) residents per average daily census; (b) ratio of primary care residents to nurses; (c) ratio of primary care residents to staff attending physicians. Measures of ease and costliness of substitution include: (a) employment arrangements of attending physicians (salaried, fee-for-service); (c) LPN to RN ratio; (d) change in inpatient days.

Estimation Method. Model (1) would be estimated using probit (logit) regression on all teaching hospitals in New York. It would be a simple cross-section with roughly 105 observations. Explanatory variables would be measured over a 3-5 year period prior to initial application for participation through the second year of the demonstration. Change in inpatient days, for example, might be measured either over the 1995-1999 period or over a more recent period such as 1997-1999. Model (2) would be estimated using an ordered probit model (Greene, 1997, p. 926). See Appendix C.2 for details.

Besides being of interest, itself, the probit [logit] or ordered probit Equation 4-3 would be used in the changes-in-residents Equation 4-2 to adjust for each teaching hospital's likely participation status. The vector of estimated participation coefficients in the first stage are used to construct an adjustment variable for selection bias that is then

inserted in a second stage. The adjustment variable is called the inverse Mills ratio or hazard function. (See Appendix C.2 for details.).

4.5 Qualitative Analyses

Several of the policy questions enumerated in Section 4.2 are best answered through case studies, site visits, and/or discussions with pertinent hospital and governmental personnel. HER has already developed an interview protocol emphasizing the hospital's participation decision. We intend to select a set of participating and nonparticipating hospitals in New York City and elsewhere and conduct in-depth interviews regarding participation. We will interview CEOs, CFOs, deans of medical school departments, hospital department chairs, and others intimately involved in the participation decision. The kinds of questions we propose to ask include:

- Who participated in the decision to reduce residency slots?
- What specialties were targeted for possible reductions? Why?
- Did the hospital's financial condition play a role in reducing residents now versus later?
- Are reduction decisions different in Academic Medical Centers?
- Why did most of the SUNY hospitals decide not to participate?
- What was the relative importance of Medicare versus state changes in GME payment in the participation decision?
- What changes in volume does the hospital expect in the future? Did this affect their decision to participate?
- How was a joint decision across hospitals accomplished? Who took the lead?
- How much did the difficulties of replacing residents on the floors enter into the decision?
- Why did the hospital decide to withdraw from the demonstration? (only for exiters)

Answers to these and similar questions will be synthesized into a qualitative model of organizational decision making that considers the internal distribution of power among

specialties in the hospital, the hospital's financial condition, and the expected future changes in the local market that could affect volumes.

Establishment of non-physician training programs (increases in existing programs) also will be determined through the site visits. Similarly, we will interview staff about the reasons for accepting or rejecting applications to the NY GME demonstration and the BBA voluntary resident-reduction program.

5 Analyses of BBA Mandatory Provisions

5.1 Overview

The evaluation design for Section 4621 (*Indirect Graduate Medical Education Payments*) and Section 4623 (*Limitation on Number of Residents and Rolling Average FTE Count*) of the BBA is the subject of this chapter. Four of the major mandatory provisions of Section 4621 are:

(1) the number of FTE residents (allopathic and osteopathic medicine) are constrained, for payment purposes, to a level that is no higher than that reported on the hospital's *Medicare Cost Report* for Fiscal Year 1996;

(2) the "multiplier factor" component of the IME adjustment factor is reduced from 1.89 in 1997 in several steps to 1.35 in 2001 and thereafter;

(3) the IRB ratio is also constrained, for payment purposes, to a rate that is no higher than that reported on the hospital's *Medicare Cost Report* for Fiscal Year 1996; and

(4) FTE resident counts are calculated on basis of a three-year moving average.

In Section 4623, covering DME, two of the mandatory provisions are similar to those in Section 4621:

(1) FTE resident caps; and

(2) the use of a three-year moving average to count FTE residents.

The rest of the chapter is organized into 6 substantive sections. Section 5.2 lists the key policy questions included in the RFP and adds two additional questions of our own. Section 5.3 describes how the ceiling on residents will be evaluated. Section 5.4 gives our evaluation plan for measuring the impacts of the 3-year rolling average count of residents. Section 5.5 puts the previous two plans to work in evaluating the changes in residents and ceilings, along with the multiplier factor, on IME. Section 5.6 describes how we intend to

control for other factors to estimate the marginal impact of the BBA mandatory provisions on the change in residents. Finally, Section 5.7 describes our approach to answering the remaining policy questions.

5.2 Key Policy Questions

The following are the key questions listed in Appendix J-1D of the RFP concerning Sections 4621 and 4623 of the BBA.

1. How do teaching hospitals ***perceive*** the impact of the reduction in the Medicare IME adjustment factor? What were their revenue replacement strategies?

2. How did the IRB ratios that comprise the caps compare to the ratios of the preceding three years?

3. What kinds of hospitals and programs seem to be most helped/harmed by the three year rolling average computation of FTE residents?

4. How many hospitals benefitted from Medicare reimbursement for more non-hospital time?

5. How were previously non-hospital residents/programs effected?

6. What are the final counts of FTE residents in allopathic and osteopathic medicine for purposes of DGME payments?

7. How many ***other*** kinds of residents of what types qualify for Medicare DGME payment?

8. How do the special rules for new facilities and for programs established after January 1, 1995, differ from the general rules? How many hospitals, and how many residents, benefit from them?

9. How do the special rules for facilities that meet the needs of under-served areas differ from the general rules? How many facilities and residents in which states benefit?

10. Do the hospitals that benefit from the DGME rolling average FTE provision differ from those that benefit from the IME rolling average FTE rules?

To this set of questions, we propose adding the following:

11. What impact did the reductions in the IME multiplier factor, the capping of residents and the Intern-Resident per Bed (IRB) ratio have on Medicare outlays when taken together and controlling for other changes?

12. What was the independent contribution of the rolling average method in calculating residents and the changes in beds have on the overall trend in IRB's and Medicare IME payments?

Question 11 requires a quasi-experimental (as opposed to a simple accounting) approach to measuring impacts. Most, if not all, of the RFP's questions are framed in an accounting manner, and we will propose a design to tabulate a number of the changes without controlling for other factors. However, we believe it is important as well to answer the primary question of the BBA's impact on resident counts and program savings after factoring out the influences of other factors.

Certain methodological challenges must be overcome in answering the policy questions. First, the link between the BBA mandatory changes and changes in residents and Medicare outlays must be isolated from other confounding factors also impacting on residents and outlays. Second, quantifying the impacts of resident caps, alone, requires forecasts of resident growth without the caps. And third, the multiplicative impacts of changes in residents, beds, and the multiplier factor on the IME add-on percentage need to be isolated.

5.3 Analysis of Resident Ceilings

In order to estimate the impact of the BBA ceilings on FTE resident counts, it is necessary to estimate what the number of FTE residents would have been in the absence of the BBA ceilings. To this end, we will estimate the time trend of FTE residents using regression techniques for the 14 years, 1984 through 1997, using data on FTE resident counts maintained by HCFA. Assuming hospital-level FTE resident counts are available from HCFA, separate trends for each hospital or by type of hospital (e.g., hospital ownership, size, IRB ratio, type of teaching hospital) will also be estimated. To account

for the possible flattening out in the rate of growth of residents, a non-linear time trend regression will be estimated.

Forecasted FTE resident counts for 1998 through 2004 (including an extra year beyond 2003 to allow for lagged responses to the BBA) will be derived by trending forward the FTE resident counts. If the time trend indicates that FTE resident counts would have continued to increase after 1996, then the difference between the estimated time trend value and the 1996 baseline ceiling becomes our estimate of the impact of the BBA resident ceiling. If the time trend started to flatten out or had peaked prior to the BBA, then the BBA resident ceiling may have had little net effect.

These differences between actual and predicted values will be calculated by hospital by year then cumulated to provide national estimates of the resident ceiling provision. Effects will also be stratified by teaching intensity (IRB) and location showing the hospital types most helped/harmed by the cap.

Once estimates of the reduced number of FTE residents have been obtained, we will estimate the impact of the resident ceiling on Medicare GME payments from 1998 through 2004. For direct medical education payments, we will first estimate the impact on the basis of a constant baseline Medicare share of inpatient days. We will then recalculate the savings using the actual difference in DME outlays will isolate resident cap from volume effects. Medicare share of days. We will then recalculate the savings using the actual annual Medicare share of days. The difference in DME outlays between the two approaches will isolate the impact of the resident cap from the changing Medicare inpatient volume. (See Section 5.5 for the impact of resident ceilings on IME outlays.)

5.4 Analysis of the Three-Year Resident Rolling Average

To estimate the impact on Medicare GME payments of using a moving average to count residents, we will first calculate baseline GME payments on the basis of what they would have been during 1998 through 2004 if moving averages had not been used, i.e., the baseline estimate. We will then calculate GME payments using moving averages of FTE

residents. The difference between these payments and the baseline IME and DME payments will represent the effect of the moving average method of counting. As with the analysis of resident ceilings, alternative estimates of the impact of the moving average counting method will be simulated by holding constant and varying the Medicare share of inpatient days for DME. Separate estimates will be simulated by type of teaching hospital and other hospital characteristics for each year through 2004.

5.5 Analysis of IME Reductions

Through changes in the IME multiplier factor, BBA Section 4621 reduced the IME payment adjustment from 7.7 percent of DRG outlays, on average, prior to the enactment of the BBA, to 5.5 percent by Fiscal Year 2001. Of the BBA's mandatory provisions, this is expected to provide the greatest *single* incentive to teaching hospitals to reduce the number of FTE residents below the Fiscal Year 1996 baseline. The effects of this provision on indirect GME payments will be examined as follows.

IME Payment Adjustment

Fiscal Year	IME Multiplier Factor	IME Rate †
1997	1.89	7.7 %
1998	1.72	7.0
1999	1.60	6.5
2000	1.47	6.0
2001	1.35	5.5

†IME payment rate = (0.405·10)·MF, where MF is the *multiplier factor* and 0.405 is the exponent in the IME payment adjustment formula:

$$((1 + IRB)^{.405} - 1) \cdot MF$$

The percent change in the IME factor can be decomposed into the percent change in the multiplier factor (MF) and the difference in the percent change in residents (RES) and beds (BED):

$$(5\text{-}1) \qquad \%\Delta IME = \%\Delta MF + a\,(\%\Delta RES - \%\Delta BED)$$

where a = .405(1/(RES(1 + RES/BED)/BED). The percent changes would be constructed, first, at the hospital level then averaged across all teaching hospitals, nationally. Because both the number of residents and the IRB are capped, we will calculate two overall percent

changes in IME, one setting increases in either variable equal to zero and a second ignoring this constraint.

To isolate the impacts of the three factors, three sets of IME percent change will be calculated by setting two percent changes equal to zero. The pure multiplier effect, for example, can be derived by ignoring actual changes in residents and beds. As before, two sets of change will be calculated with and without the constraint on increases in residents and the IRB at the hospital level. These analyses will be performed by counting FTEs using the three-year moving average allowed by Sections 4621. Data from only those teaching hospitals in existence prior to January 1995 will be used because subparagraph H of Section 4623 allows the Secretary of the Department of Health and Human Services to employ special rules for new facilities.

To the extent possible, separate estimates will be provided by type of teaching hospital and other hospital characteristics for each year through 2004, if time and data permit.

5.6 Combined Impact of the Provisions on Residents

The above BBA provisions all went into effect at the same time in Federal Fiscal Year, 1998. It will, thus, be impossible to identify the separate behavioral effects of each of these provisions on the number of FTE residents. However, it should be possible to estimate their combined effect on residents.

To investigate the behavioral impact of the mandatory BBA provisions, we propose to use all U.S. teaching hospitals (including those in NY) that do not participate in the resident reduction initiatives. This approach will be feasible, if, as we expect, the proportion of teaching hospitals that participate in the BBA's voluntary resident reduction program is small, e.g., less than ten percent.[1]

To estimate the programmatic effects, a panel model similar to Equation 4-2 will be estimated.

[1] With more than half of the hospitals that initially agreed to join the NY GME demonstration having withdrawn from the demonstration, and with possible further withdrawals occurring prior to the end of the second demonstration year, the ten percent "cut-off" figure is somewhat arbitrary but is probably reasonable.

$$(5\text{-}2) \quad y_{i,t} = \sum_{k=1}^{K} \beta_k X_{i,t,k} + \sum_{t=1}^{T} \pi_t P_t + \sum_{t=1}^{T} \omega_t BBA_t + \mu_{i,t} \quad i = 1,\ldots,N; \quad t = 1,\ldots,T.$$

Excluded from the model will be the demonstration variable, D, and its interactions with the time period binary variables. Without a control group to test BBA effects, the experimental design becomes a simple pre/post trend model. A series of time period binary variables, BBA_t, can be used to represent the mandatory BBA provisions. Prior to implementation, BBA will be set equal to zero while in the post-implementation years, FY98 and beyond, BBA will be set equal to one.

The coefficients for the post-implementation BBA variables indicate the direction and magnitude, if any, of the combined BBA effects, measured as deviations from the underlying trend in residents. Because of the other concurrent factors (e.g., de-regulation of hospital payment rates) affecting the demand for residents in NY, we expect that the NY hospitals will have a larger reduction than other U.S. hospitals. Thus, a binary variable representing non-participating NY hospitals will be included as an explanatory variable.

To determine whether certain types or classes of hospitals are disproportionately helped/harmed by the BBA provisions, variables representing hospital classes can be interacted with the BBA dummy variables. Other hospital characteristics that will be studied include (a) hospital bed size, (b) IRB ratio, (c) type of teaching, and (d) location.

5.7 Miscellaneous Analyses

Evaluations of Questions 1, 4, 5, and 7 through 9 require different approaches than for the other policy questions in Section 5.2.

5.7.1 Perceptions of IME Impacts

To address how teaching hospitals *perceive* the impact of IME reductions and what their revenue replacement strategies were (Question 1), we will include these subjects in our interviews of teaching hospitals. While the IME reductions apply to all teaching hospitals,

we will probably limit the interviews to hospitals participating in the NY GME demonstration and the BBA's voluntary resident-reduction program and their control hospitals. The final mix of teaching hospitals to be visited outside New York will be determined pending the implementation of S4626 and the Consortia Demonstration.) Interviews with teaching hospitals will also be used to evaluate the impact of Medicare reimbursement to teaching hospitals for qualifying resident rotations in non-hospital settings (Questions 4 and 5) because of the lack of data on non-hospital rotations prior to the BBA and the general lack of information on non-hospital residency programs.

5.7.2 Other Types of Residents

Aside from medical doctors (MDs) and osteopaths, a review of IRIS codes and the *Federal Register* (May 8, 1998) indicates that only dental and podiatry residents are eligible for Medicare direct GME payments (Question 7). We will also make enquiries of HCFA policy personnel to ascertain whether "physicians" such as optometrists and chiropractors[2] and non-physician trainees qualify for direct GME payments.

5.7.3 Description and Impact of the Special Rules

As directed by BBA Section 4623, special rules for new facilities (programs) and facilities serving under-served areas were originally issued in the *Federal Register* (August 29, 1997). Many of the special rules are embedded in examples that show how calculations (e.g., three-year rolling average of FTE residents) are performed. Clarification, elaboration, and modification of the qualifying criteria (e.g., how new programs are defined) and the rules themselves were published in at a later date (*Federal Register* May 12, 1998). To evaluate Questions 8 and 9, we will first produce a consolidated list of the qualifying criteria and, similarly, a list of special rules. The list of special rules will be contrasted with the general rules). Since the qualifying criteria specify that hospitals must apply to HCFA in order to be

[2]When HCFA's Physician Registry was initially established, physicians were considered to be anybody with one the seven following credentials: MDs, osteopaths, DDM, DDS, podiatrists, optometrists, and chiropractors.

covered by the special rules, we will obtain from HCFA a list of qualifying hospitals and programs. The number of qualifying hospitals, by characteristic (e.g., urban/rural, under-served areas, and state) will be tabulated, as will the be the number of affected residents.

6 Analyses of Substitution of Personnel for Residents in Patient Care

6.1 Overview

This chapter addresses the critical issue of how teaching hospitals may have responded to the reduction in residents by substituting other physician and non-physician personnel for resident services. Substitution will be more or less necessary depending upon how involved residents are in direct patient care. In this chapter, we propose to use the theory of production to systematically evaluate the extent of substitution and the primary factors driving any changes in the patient care provider mix. In applying this theory, a production function is specified relating a vector of inputs to output. Input levels and mixes will vary depending upon output and input prices. Hospitals operating in high demand areas will produce more output and, hence, demand more inputs. The level and mix of inputs will vary by supplier depending upon relative input prices.

Several limitations to the basic theory present challenges in evaluating the substitution of other personnel for residents.

- Hospitals produce a heterogeneous output of inpatient stays and outpatient visits, each of varying complexity, as well as teaching new physicians and other allied health personnel. Simply counting the number of inpatient discharges, for example, would grossly understate output.
- Limits on the degree of substitution exist between residents and both nonphysician personnel and attending physicians. Hence large shifts in the effective resident wage due to Medicare GME rollbacks may have no effect on the mix of attendings versus residents.
- Teaching hospitals likely incur a negative effective resident wage for residents that creates strong biases towards using and maintaining resident complements even with significant changes in GME payment policies.

The chapter is presented in four substantive sections. Section 6.2 repeats the relevant research questions from HCFA's RFP with additional questions HER staff propose to answer.

Section 6.3 presents our tabular analyses while Section 6.4 extends the tabular work with multivariate analyses of various types. Finally, Section 6.5 concludes with a description of the qualitative case study research we intend to conduct.

6.2 Key Policy Questions

Three policy questions relating to personnel substitution for residents appeared in HCFA's RFP:

1. What strategies did demonstration sites use to maintain delivery of patient services formerly provided by residents? What kinds of staffing substitutions occurred? (J-1C)
2. Did resident medical involvement in patient care delivery change? (J-1D, Overall Q. 4)
3. Did the quality of care provided by teaching institutions change, and were the changes in quality related to less reliance on medical residents and greater reliance on nurse practitioners, physician assistants and/or clinical nurse practitioners to prove (sic) care? (J-1D, Overall Q. 5)

The third question we interpret as a personnel substitution question in the first instance. Any quality impacts of substitution are addressed later in Chapter 7.

HER staff recommend a few more questions to sharpen the analysis of substitution:

4. Did other hospital inputs rise in response to a fall in residents? If so, which inputs?
5. What was the substitution relationship between residents and attending physicians?
6. What happened to hospital output with changes in residents?
7. Was the shift in input mix greater (or different) in demonstration vs. non-demonstration hospitals?

We intend to answer all of the questions as best we can given data limitations (e.g., non-resident input figures) for the NY demonstration, the Section 4626 program, and the BBA mandatory provisions in general.

6.3 Tabular Analyses.

A range of informative tables will be constructed as part of the evaluation. A first set will simply show changes in the number of residents, key nonphysician personnel (or NPPs, e.g., nurses), and attending physicians before and during the evaluation period. (See Section 6.4.2 for discussion of data sources.) The counts will be summed across all teaching hospitals in New York (or nationally) as well as decomposed by key hospital characteristic, e.g., demonstration participants versus nonparticipants, by IRB level, by bedsize, by specialty mix of residents, by inner city, suburban, rural location. The specialty mix is hypothesized to be important as hospitals training more primary care residents should exhibit less change in the resident mix.

A second set of tables will show pre/post comparisons in the change in nonphysician personnel, attending physicians, output, and case mix, stratified by changes in hospital residents. These tables will show, for example, the change in RNs and LPNs over a five-year period for teaching hospitals exhibiting as large, average, and small resident reductions versus increases in residents.

The major limitation of the first few tables is that they do not control for output. With large expected declines in inpatient days due to the influx of HMOs in New York and elsewhere, it is quite likely that both residents and nonphysician practitioners will decline. Therefore, in a third set of tables, we would show comparisons in average (inverse) productivity ratios of residents, NPPs, and attending physicians, again stratified by the same hospital characteristics.[1] Declines in resident FTEs per 1,000 days or outpatient visits would definitely imply a change in the medical involvement of residents in patient care. Of course, resident tasking could change as well, which would not necessarily be reflected in resident-per-day ratios; hence, the need for case study interviews (discussed later in this chapter).

[1] For example, hospitals experiencing a 25% decline in residents might also experience a 10% decline in inpatient days, with resident FTEs per 1,000 days falling from 2 to 1.6, only a 20% decline. At the same time, the nurse-per-1,000 day ratio might rise 3%, indicative of a net substitution.

6.4 Multivariate Analyses

All tabular analyses suffer in some respects from an inability to hold all relevant confounding variables constant when testing a single substitution response. Our ultimate goal is to isolate the impact of the declining payment for residents on the mix of inputs in patient care.

One solution seen in the literature (e.g., Knickman, 1992) is to conduct time-and-motion studies of what tasks the various inputs are involved in, deriving average fixed input ratios. While extremely valuable in understanding how residents could be substituted for and by whom, these approaches lack generalizability and are very expensive. Different hospitals will have different kinds of patients and operate with different input mixes, both of which influence the degree of substitution. To avoid too parochial a view of the different kinds of substitution arrangements, multivariate analysis of all teaching hospitals in New York (and nationally) provides a more global average estimate of the substitution possibilities.

6.4.1 Estimation Method

Much of the previous published research on hospitals has focused on labor demand estimation (e.g., Sloan and Steinwald, 1980; Robinson, 1988; Pope and Menke, 1990; Sloan, Morrisey, and Valvona, 1988; Hadley and Zuckerman, 1990) or cost function estimation (e.g., Granneman, Brown, and Pauly, 1986; Friedman and Pauly, 1983; Cowing and Holtmann, 1980). Practically all of these studies explicitly consider the multiproduct nature of hospital output. Input substitution possibilities specifically for residents have not been addressed in a multivariate framework as far as we know.

Economic cost theory of the firm provides the model for properly estimating the influences of various factors on resident input shares (relative to other inputs). Employing a translog cost function, a set of seemingly unrelated regressions can be estimated on a set of input cost shares (including residents) as a (log linear) function of the prices of all the relevant inputs (Greene, 1993, p. 505). For example, the share of residents' costs in all direct patient care costs is assumed to be influenced by residents' own effective "price" and the

prices of nurses and all the other (potentially substitutable) inputs. The coefficient of the resident's own price should be negative under standard cost minimization assumptions. As residents become more expensive, fewer of them should be used in patient care. The coefficients of substitutable inputs should be positive; higher nurse wages, for example, should result in more residents being used. Hospital output drops out of the input share equations by assuming constant returns to scale, which may be reasonable for relatively small output changes. Thus, while output changes should alter the overall demand for residents, it should have little effect on use of residents relative to nurses and other inputs.

The key point of this modelling approach is the need to control for any changes in the true costs of hospital inputs that might substitute for residents. Without such controls, a reduction in residents-to-RNs, for example, may be attributed to changes only in GME payments when increases in nurse wages may also be contributing to the shift.

Once the set of share equations are estimated, the extent of substitution of another input for residents (called the elasticity of substitution) can be calculated as

(6-1) $\sigma_m = 1 + (z/s_r s_n)$,

where $(z/s_r s_n)$ = the logged price coefficient of NPPs in the resident's cost share equation, divided by the product of the two shares.

We are also interested in how much of a shift in the resident share of input costs is due to changes in GME payment holding other factors constant. This can be simulated by calculating the marginal impact of the changing effective resident price over time (i.e., the resident's stipend, adjusted for IME and DME payments). Prices of other inputs are held constant, and changes in the resident's effective price, or cost, to hospitals is weighted by its own factor price coefficient appearing in its own cost share. In order to estimate the share equations, information is needed on the effective unit costs of each input and FTE levels used.

6.4.2 Measurement Challenges

In both the tabular and multivariate work, heroic measurement challenges must be overcome in order to derive even approximate estimates of the degree of substitution. The data problems can be classified in three areas: (1) output; (2) inputs; and (3) net factor prices.

Output measurement problems. While output changes theoretically do not affect factor shares, this assumption only holds for entities producing similar products; otherwise, quite different production processes can have impacts on input shares. The set of observations will include all teaching hospitals in New York or in other states for the BBA evaluation. Even within teaching hospitals, considerable variation exists in key outputs such as case-mix severity and outpatient services. We recommend re-estimating the share equations controlling for the Medicare case-mix index and the share of revenues from outpatient and emergency room services. We also recommend controlling for the split of surgical and medical cases using Medicare data.

Input measurement problems. Input price measurement problems must be solved in order to derive a true measure of the change in the resident's effective wage. Constructing a measure of the net effective resident wage is highly desirable as it is the single best proxy for the changing incentive facing the hospital to reduce resident slots under the revised GME payment methods.

We have already developed a method for constructing a measure of residents' effective cost to hospitals (it may be negative; see Appendix A.2, eq. A-16). Fortunately, for the New York evaluation, New York State's Institutional Cost Report (ICR) is an excellent source of data on personnel inputs and costs. Exhibit 35 is a Hospital Personnel Wage Survey. FTE counts, paid hours, and fringe benefits are reported for each of 30-odd labor categories, including residents. Column 9 even calculates an average hourly wage for each labor category. For the BBA evaluation of non-New York hospitals, we will have to rely on the much less detailed AHA survey data on the FTEs in a few labor categories and their associated payrolls.

6.5 Qualitative Case Study Analysis

The great strength of quantitative analysis is its generalizability. Its weaknesses are in its strong assumptions and "black box" appearance. This is why we are proposing to conduct extensive interviews in demonstration and control teaching hospitals pertaining to the seven questions raised at the beginning of this chapter. If resident counts went down and NPPs increased, we want to be able to describe how this was accomplished. The same is true of attendings. If their input increased, how was this accomplished? Which tasks did they take on? How were new attendings recruited? If hospitals with very different mixes of residencies exhibited different levels of substitution, we want to describe the reasons for the differences. Were anesthesia residents replaced by CRNAs or anesthesiologists? Who replaced surgical residents versus psychiatry or medical residents?

We intend to conduct intensive interviews with key personnel decision makers in the sample hospitals. They would include the CFO, who has overall responsibility for the hospital's bottom line, and the clinical department chairmen, who often will be the medical school chairs as well. We also propose talking with groups of ICU, surgery, and floor nurses on any changes in their tasking and scheduling as a result of the decline in residents. Finally, we propose talking with residents themselves in key specialties. We can't talk to the "unmatched" first year residents whose slots were eliminated, but we can talk with PGY-2, 3, and 4 residents about any changes in their tasking, such as playing more of an attending role or NPP role, as well as their observations on changes in the tasking of their NPP and attending colleagues.

A variety of demonstration and control hospitals in New York will be selected for interviews regarding a number of issues including input substitution. The final choice of sites will be made in the evaluation phase based on a stable set of demonstration participants. Similarly, a set of study and control hospitals elsewhere in the United States will be targeted for interviews when evaluating the BBA voluntary reduction program once it is implemented.

7

Analyses of Changes in Patient and Service Mix, Access, Quality of Care

7.1 Overview

Reductions in resident counts may affect access, quality, and patient mix, depending on: (1) the number and specialty of those positions that are cut; (2) the number and type of hospital personnel used to substitute for those positions; and (3) how quickly that substitution takes place. The impact could be either positive or negative, depending on the skill level of the personnel and the speed with which they are deployed. Of particular concern are those safety-net hospitals in New York City that serve a disproportionate number of the poor (both Medicaid and uninsured). Residents working in these hospitals are disproportionately IMGs, suggesting that these institutions may have had difficulty recruiting staff. In addition, many of these safety-net hospitals are public institutions operated by the city's Health and Hospitals Corporation, and may have limited funds to use for nurse practitioners or other more highly skilled staff that could substitute for residents.

This chapter presents our analysis plans regarding service mix, access, and quality for both the New York resident reduction demonstration and the national BBA voluntary reduction program. Emphasis is given to the New York demonstration for two reasons. First, hospitals have been participating for two years and the data sources and control groups are clearly understood. Second, most of the methods developed for New York will extend to the BBA evaluation. We will note where they differ.

The rest of the chapter is presented in 5 substantive sections. Section 7.2 lists the primary policy questions surrounding services, access, and patient quality of care. Section 7.3 presents our analysis plans for measuring changes in patient and service mix linked to resident reductions. Section 7.4 describes analyses involving the access to care to teaching hospitals, generally, and to ambulatory care, in particular. Section 7.5 presents analysis plans

evaluating changes in the quality of patient care while Section 7.6 describes our plans for community-based case studies that deal with access and quality issues from the perspective of non-hospital providers and advocacy organizations.

As with previous chapters, the analysis plans for access and quality are grounded in in-depth site visits HER staff have made to several upstate and downstate New York hospitals (see Section 7.5).

7.2 Key Policy Questions

The RFP listed 3 groups of questions involving service mix, access to care, and quality of care impacts from downsizing residents:

1. Was the volume of such services maintained during the demonstration? If not, what kinds were adversely affected? Was the volume decline attributable to the reduction in residents? (J-1C; J-1D)

2. Did the quality of the care delivered change? If so, was the change attributable to decreased dependence on medical residents and increased use of nurse practitioners, clinical nurse specialists and/or physician assistants in hospital settings? (J-1C; J-1D)

3. Did the volume of charity care change? Were there significant changes in the inpatient and/or outpatient case mix of participating institutions? (J-1C; J-1D)

In addition, HER proposes a few questions as well:

4. Were there measurable changes in the frequency of preventable admissions in market areas served by participating hospitals? Were there changes in the frequency of preventive services, ambulatory follow-up rates, and clinic and operating room cancellation rates in New York safety net hospitals?

5. Did the complication rate change in New York demo versus control hospitals?

6. What were the perceptions of the access and quality impacts of the New York demonstration reported by community-based health providers?

7.3 Patient and Service Mix

7.3.1 Change in the Proportion of Poor Patients

With a diminished number of residents and a limited ability to substitute, hospitals may treat relatively fewer Medicaid and uninsured patients, shifting to better-paying privately insured patients. Payer mix can be identified from New York's uniform hospital discharge system (SPARCS) and the hospital Institutional Cost Reports (ICRs).

Using both the SPARCS and the ICR data, we will construct a pre and post-demonstration time series on the percent of uninsured and charity patients by New York teaching hospital. Tables will be constructed showing the annual changes in the uninsured percentage for each participating hospital, separately, and aggregated for all other New York teaching hospitals. Next, using the quasi-experimental design, the uninsured percentage will be regressed on an annual time trend with separate dummy variables for participating and non-participating hospitals. A time-demonstration interaction term will be added as the definitive statistical test of any difference in the trend in percent uninsured between demonstration and control hospitals.

7.3.2 Changes in the Mix of Medical Conditions and Surgical Procedures

Service mix may shift in hospitals that downsize the number of residency positions in a given specialty or that eliminate a program entirely. For example, a hospital that reduces the number of orthopedic surgery residents may end up performing fewer joint replacements or other orthopedic procedures. Shifts in the mix of medical conditions (identified by diagnosis) and in surgical procedures can be identified from the SPARCS hospital abstract system. Such shifts may represent a more cost-effective approach to treatment, e.g., if a consortium concentrates all of its orthopedic surgery in a single hospital rather than in two or three. Similarly, a reduction of surgical residents and their concentration in a single location could help reduce excess surgical capacity, resulting in a decline in the rate of inappropriate procedures.

Two types of tabular analysis are proposed in studying changes in service mix. First, we will construct a set of tables of procedure rates by year by New York participating hospital versus control group hospitals as a whole. As there are hundreds of DRGs and thousands of procedures, we will first compare surgical versus medical admission rates. Then, within surgery, we will generate tables on the 10-20 highest frequency procedures, such as hernia repair, angiography, hip & knee operations, etc. Time series regression using dummy variables will then be used to test for statistical differences in procedure trends between study and control hospitals.

The second type of service mix analysis will link the change in residents to changes in service mix more precisely. Using IRIS data, we will measure the percent change in residents by specialty by New York hospital over the demonstration period. Then, for surgical residencies with the largest percent reductions in residents, we will identify a set of surgical procedures most likely performed by residency programs experiencing the greatest downsizing in participation hospitals. Participating hospitals will likely exhibit different downsizing rates by program, implying different surgical procedures that might potentially be affected. Finally, we will rerun the time series regression model on the pooled study and control hospitals for the joint set of potentially impacted procedures. If downsizing had any effect on service procedure volumes, this test should verify the relationship.

7.4 Access to Care

7.4.1 Changes in Access to Teaching Hospitals

With fewer residents available to care for patients, some hospitals may restrict access, especially for certain types of patients, e.g., trauma cases. Hospitals could do this in several ways. They could limit the number of referring physicians from whom they will accept admissions, or they might limit ER hours or even close the ER altogether. SPARCS data will be used to document changes in the volume of admissions for specific conditions, such as trauma, and in the proportion of admissions generated from the ER. These changes will be examined both overall and by payer. In addition, Institutional Cost Report data can be used

to examine changes in the volume of total ER visits and total outpatient visits (by type of clinic visit). Visit volume will also be disaggregated by payer.

As in the previous service mix plans, tables will be constructed showing numbers of cases in key access-related conditions such as trauma and heart attacks by year by participating hospital versus the overall control group in New York. Similar tables will be generated for ER and outpatient clinic visits. Inpatient admissions from the ER will be separately tabled. Time series regression will be used to test for study versus control differences in rates pre and post-demonstration.

We will attempt to collect from individual hospitals (or possibly from ambulance companies) the amount of time their ER is "on divert", e.g., is closed for referral because it is unable to accept new patients. This would signal an inability of ER staff to handle existing emergency cases. Finally, we will conduct an extensive community-based case study (described below) to collect qualitative information on access problems.

7.4.2 Changes in Access to Ambulatory Care

Unfortunately, there are no uniform secondary data collected on care provided in hospital outpatient clinics. However, there is one critical measure of access to outpatient care that we can measure: preventable admissions. These are hospitalizations that could have been avoided with adequate and timely ambulatory care. Professor Billings and his colleagues have developed a list of ambulatory care sensitive admissions for both adults and children that can be identified using ICD-9 diagnoses on hospital claims (and from SPARCS data). Examples of such preventable admissions are: asthma, bacterial pneumonia, gastroenteritis, cellulitis, etc. We propose to calculate population-based rates of these preventable admissions for individual hospital catchment areas developed by Billings and compare changes over time. Similarly, SPARCS data can be used to compare changes in rates of low birth weight deliveries among patients residing in hospital catchment areas and who presumably were followed in outpatient clinics.

Preventable admission rates and low birth weight rates within each participating and control hospital in New York will be tabled by year by each study hospital and for the control group as a whole. Time series regression will be used to test whether preventable admission and low birth weight rates are increasing in participating hospital catchment areas versus those of control hospitals. Clearly, many other factors can be affecting these rates besides resident downsizing. Nevertheless, a null finding would be interpreted as downsizing having little or no demonstrable effect on access to ambulatory care. We will also attempt to include a few other explanatory variables in the analysis such as primary care physicians per capita and managed care penetration rates.

Besides the simple count of visits reported in the Institutional Cost Reports, New York City's Health and Hospitals Corporation (HHC) has implemented performance indicators for all of its member hospitals. This system was specifically designed to track performance of the attending physicians who provide care to all HHC patients through contract with various medical schools, but it can be used to track access across hospitals more generally. This will allow us to compare changes over time for this important subset of city hospitals, including both demonstration and non-demonstration HHC institutions. Relevant access indicators include:

- Preventive services: immunization of two-year olds, Pap tests, mammography;
- Ambulatory follow-up after hospital discharge;
- Scheduled clinic visits must not be canceled and clinic providers must be on time;
- Scheduled OR procedures must not be canceled and OR providers must be on time;
- Transfers from the hospital and referrals from the OPD are permitted only when appropriate; and
- Cultural and linguistic competency.

We propose to work with HHC staff in generating summary performance statistics on each of these indicators over time. Tables will be constructed showing time trends among HHC surviving participants and those that dropped out of the demonstration.

7.5 Quality of Care

7.5.1 Measures Based on Case Studies

Based on our initial New York site visits, we have identified the following areas where residency reductions could potentially impact quality of care in demonstration hospitals. We intend to follow up with in-depth case study interviews in more sites during the formal evaluation. Each area will be investigated using informant comments as a guide.

- Operating Rooms. Anesthesia programs were frequently targeted as one of the first programs to be cut. Some informants stated that the anesthesia programs were poor quality residency programs to start with, and replacing residents with attendings or non-physician staff could be an improvement. However, other informants reported difficulties in finding qualified anesthesia personnel to staff the ORs.

- Inpatient Wards. The single most common complaint was the difficulty of staffing "night call". A smaller number of residents are being spread across a larger number of beds at night, raising the possibility of increased adverse events. Hospitals have had mixed experience in recruiting other physician and non-physician staff to work at night. Staffing night call is a particular problem in those hospitals that have cut back on their internal medicine and pediatrics residents. One hospital that had eliminated its orthopedics program, but continues to perform orthopedic surgery, expressed concern about using general surgical residents (rather than orthopedic residents) to cover the service at night.

- ICUs. Residency reductions have resulted in diminished staffing in some ICUs as well. (These includes SICUs, MICUs, and NICUs.) Some informants also reported that residents now receive less dedicated ICU time, and thus have less experience with critical cases. Thus, an increase in adverse events in the ICU, especially at night, is a possible outcome.

- Outpatient Clinics. Fewer residents available to staff outpatient clinics have greatly increased the burden on attending physicians. Possible outcomes include: increased wait times for appointments, increased wait

times in the clinic itself, and shorter visits. Waiting times may be greater for specialists than for primary care physicians. At the same time, Medicaid managed care requirements are believed to have increased productivity in the OPDs and shortened wait times.

- Emergency Rooms. Emergency medicine residency programs have generally not been cut to date. Cuts in other programs, like internal medicine and pediatrics, however, may affect staff availability in the ER. Although no specific problems with the ER were raised during the site visit, informants expressed a more general concern about possible quality problems in the ER and suggested an evaluation of the following types of measures: ER waiting times, ER walk-out rates, and death within 24 hours of an ER visit.

- Psychiatric Units. Psychiatric residency programs were identified as among the most expendable, and have been cut in a number of hospitals. Quality of care could suffer among psychiatric inpatients if knowledgeable staff are not available to care for them. Possible outcome measures include: adverse side-effects from psychotropic drugs, and relapses/re-hospitalization following a psychiatric admission.

- Radiology. Another residency program frequently targeted as part of residency reductions is radiology. Some hospitals have eliminated their entire radiology programs. X-ray call-backs and misreads are possible adverse outcomes if qualified radiology staff are not available. This may be a particular problem nights and weekends. One demonstration hospital has no radiologist on-site between the hours of 6 p.m. and 8 a.m. or at any time on Sunday. During off-hours, x-rays are read remotely by attending radiologists (using teleradiology equipment recently acquired by the hospital).

Many of the quality variables are straightforward to construct and do not require elaboration, e.g., return to ICU. A few, unfortunately, are either difficult or impossible to accurately measure. New York hospitals stated that they collected information on waiting times, but the consistency and completeness of this information was not validated. The availability of such data prior to the demonstration is also not clear. (Managed care plans impose waiting time maximums on hospital clinics, so collection of these data may or may not pre-date the implementation of Medicaid managed care in New York.) Finally, we did not assess the willingness of non-demonstration hospitals to provide us with comparable

data. Availability and completeness of ER waiting times and other statistics are highly variable across hospitals. Nor have we not identified any secondary data source that would allow us to evaluate the impact of radiology cut-backs on the quality of care. We propose a series of focused interviews, instead, with the following types of personnel: administrative staff responsible for the decision (medical director, CFO, former director of the radiology residency program), attending radiologists, and clinical staff most likely to be affected by the lack of radiology support (ER physicians and nurses, attending physicians and residents responsible for night call, etc.).

7.5.2 Risk-Adjusted Outcomes

The Greater New York Hospital Association (GNYHA) has used SPARCS data to develop a comparative performance measurement system for member hospitals. This system compares expected with actual outcomes on a risk-adjusted basis. Regression models were used to develop expected outcomes (mortality, complication rates) after adjusting for sociodemographic characteristics, diagnoses, transfer status, etc. GNYHA has already constructed these outcome measures for three pre-demonstration years (1995-1997) and are about to work on 1998.

We are currently working with GNYHA on ways in which we might collaborate in quality measurement. These expected relative-to-actual outcomes are considered highly confidential and are shared only with the individual institutions involved; no data are reported publicly. Thus, we do not expect to obtain access to any of the GNYHA data. However, since their models are based on the same SPARCS data that we propose to use, it would be very useful to review their regression models and compare them with CSP and with our own algorithms. Since the GNYHA models were developed from New York hospitals only, they may be more sensitive to unique characteristics of area hospitals and area patients. We will either have GNYHA staff generate aggregated statistics from their internal problems or we will mimic their risk algorithms ourselves using the SPARCS data.

7.5.3 Complication Rates

Our measure of quality using complication rates merits more detailed discussion. Numerous tools exist that can be used to assess patient severity and to calculate severity-adjusted hospital quality. However, application of tools that require collection of clinical data from medical records (such as MedisGroups) can be prohibitively expensive. Given the number of hospitals (and number of discharges) in our sample, we propose to use the Complications Screening Program (CSP) developed by Iezzoni *et al.* (1994) to assess hospital quality. CSP was developed as a method using standard hospital discharge abstract data to identify 27 potentially preventable in-hospital complications, such as post-operative pneumonia, hemorrhage, and wound infection. The screening algorithms are based on selected data elements contained in standard discharge abstracts like the SPARCS: patient age, sex, ICD-9-CM diagnosis and procedure codes, DRG, and number of days from admission to principal major surgeries or procedures. The unit of observation is the hospital. For each hospital, rates are calculated by adding the number of cases flagged as potentially problematic by the CSP (the numerator) and dividing this by the number of patients treated at the hospital (the denominator). Rate-related screens indicate outcomes or events which do not raise concern as individual occurrences. Instead, the focus is on the rate of occurrence at a particular hospital. A hospital with a much higher rate of these outcomes than expected may be providing a substandard level of care.

The CSP program was developed primarily for use with Medicare records, and as a result, excludes OB and pediatric conditions. Complications of pregnancy and childbirth can be readily identified by ICD-9 codes. We will work with Dr. Blumenthal and pediatric colleagues at MGH to construct a measure of complications for pediatric inpatients.

Dr. Iezzoni recently completed a medical record validation of her CSP program (personal communication, 1999). She found that CSP did a good job of identifying post-operative complications, but fared poorly with medical conditions. The principal reason was that conditions existing at the time of admission could not be distinguished from new conditions arising during the course of the hospital stay. Medicare claims, like most

inpatient hospital discharge abstract systems, report all diagnoses documented by the time of discharge, regardless of when they occurred. SPARCS data are unique, however, in that each secondary diagnosis has a flag associated with it, indicating whether it was present at admission or appeared subsequently. Dr. Iezzoni believes that use of this flag would overcome the problems she encountered when validating the CSP program using Medicare claims data.

7.6 Community-Based Case Studies

Finally, we will supplement our analysis of access and quality by an intensive round of community-based site visits. The emphasis of these site visits will be in New York City, particularly in those communities served by safety-net hospitals. However, a second set of site visits will also take place in Buffalo. (These community site visits are to be distinguished from those made to demonstration hospitals.) Potential respondents for these community-based case studies will be medical directors from neighborhood health centers, ambulance drivers, staff at local advocacy organizations, consumer representatives, and others who can report on quality and access in teaching hospitals that have downsized their residency programs. The focus of these interviews would be on issues such as the following:

- Difficulties encountered in making referrals to hospitals, or otherwise gaining access to hospital facilities (both inpatient and outpatient);
- ER closures, ERs not adequately staffed, ERs not able to accept certain types of patients (e.g., trauma), amount of time ERs are placed "on divert";
- Waiting times and walk-out rates in the ER; and
- Availability of nursing and physician staff to provide timely, quality care in the ER and OPD.

8 Analyses of Changes in Payer Mix, Managed Care Participation, and Hospital Financial Condition

8.1 Overview

A major concern over GME rollbacks is the extra financial burden placed on teaching hospitals. Nowhere is the issue more acute than in New York. Not only are hospitals faced with significant reductions in Medicare GME, they are also expecting the shift of millions of Medicaid and private patients into managed care. The evaluation of the New York demonstration, as well as the national BBA, must consider the dependency of teaching hospitals on Medicare and Medicaid payment methods, how the shift to managed care is possibly taking GME support away, and what all the changes mean for their bottom lines.

The effects of the BBA provisions on the financial condition of hospitals must also be ascertained. Since the BBA voluntary reduction program has not yet commenced, nothing is known about the potential participants. However, several things are certain. Hospitals in New York, with the possible exception of Maryland, face more comprehensive controls on their behavior than in other states. Unlike Maryland, however, New York recently abandoned its comprehensive rate setting system, NYPHRM. New York hospitals, thus, have been suddenly thrust into a new set of market conditions, including the potential entrance of effective managed care organizations. It is not likely that hospitals participating in the BBA Section 4626 program will face so many simultaneous dramatic changes in their market environments. The challenge of this part of the evaluation will be to isolate Medicare GME effects from the other pervasive market influences buffeting teaching hospitals.

The rest of this chapter is organized into 7 substantive sections. Section 8.2 reviews the key policy questions with several new questions beyond those appearing in HCFA's RFP. Section 8.3 presents our evaluation plans for changes in payer mix and managed care. Section 8.4 describes how we propose to analyze changes in operating and non-operating revenues and the financial impact of managed care discounting. Section 8.5 describes our

tabular analyses of changes in costs of care from downsizing. Section 8.6 gives our plans for analyzing hospital margins, supplemented by Section 8.7 on other hospital financial solvency ratios. Finally, Section 8.8 summarizes our case study plans for soliciting provider perceptions of the financial impacts of downsizing.

8.2 Key Policy Questions

HCFA's RFP had very few specific questions regarding the central topics of this chapter. The only one on payer mix in the set of New York questions was:

1. Did the volume of charity care change? (J-1C)

In the set of BBA-related questions in Appendix J-1D of the RFP, the only explicit question on hospital revenues and finances came under Section 4621, IME payments:

2. How do teaching hospitals **perceive** the impact of the reduction in the Medicare IME adjustment factor? What were their revenue replacement strategies?

A related managed care question was:

3. Were teaching hospital negotiated rates from managed care plans modified on account of the "AAPCC" carveout?

The RFP did include Deliverable A8, however, requiring a report summarizing changes in payment arrangements, payer mix, payer type, managed care involvement, and financial conditions of the participating New York demonstration hospitals. Thus, we have developed an additional set of policy questions in this area:

4. Did sites agreeing to reduce their residency programs change their payer mix in any way to replace the lost GME revenues?

5. Did participating hospitals become more dependent on managed care revenues? Did greater dependency restrict the hospitals' ability to offset GME lost revenues?

6. What impact did the BBA mandatory GME provisions and/or participation in resident downsizing initiatives have on hospital finances, including trends in operating and total margins and other financial solvency ratios?

7. Were hospitals able to increase outside funding sources for GME?

8. What impact did resident downsizing have on overall hospital cost per discharge?

To perform the financial analyses for the NY GME demonstration, New York State Institutional Cost Report (ICR) data will be used. The Institutional Cost Reports usually collect more detailed financial data than Medicare Cost Reports (MCRs). To perform the financial analyses for the BBA demonstration, two sources of data will be used. First, we expect to obtain income and balance sheets and other data directly from participating hospitals. Second, HCRIS data, which are MCR abstracts, will be used for the non-participating hospitals.

In the descriptions of the financial analyses that follow, the focus will be on the analyses that the New York ICRs will support. Similar analyses of the BBA impacts on finances will be performed to the extent that the MCR data will allow.

8.3 Payer Mix and Managed Care

Exhibits 32 and 33 of New York's ICR provide breakdowns of discharges, inpatient days, ambulatory visits, and ambulatory surgery, *inter alia*, for 14 different payer categories. The key groups include: Medicare, Medicaid, indemnity, Medicare HMO, Medicaid HMO, and uninsured. We will construct a lengthy time series of individual hospital data from the ICR's, which are superior to the MCR in their payer decomposition.

The data will be used for several important analyses. First, overall trends in days and discharges will be reported for Medicare, Medicaid, and private patients, broken out by fee-for-service versus HMO. This will allow us to show which hospitals are most dependent on Medicare and its GME rollbacks versus Medicaid and New York private payers with their GME rollbacks. As important, we can report the growth in HMO penetration rates by hospital. Although no ICR breakout exists of revenues by the 14 payers, we can use the HMO trends to (1) link the managed care pressures to changes in patient practice patterns (e.g., length of stay) and total patient revenues, and to (2) derive an expected HMO growth

variable to be used in predicting the hospital's likelihood of participating in the hold harmless demonstration.

Next, we will measure the variation in level and trends in free, courtesy, and uninsured days and discharges by hospital to test the null hypothesis that reduced resident counts will not affect the poor's access to hospital care. Uninsured volumes will be split between inpatient and outpatient care to test another hypothesis that the uninsured will not see their site of care affected by any GME rollbacks.

Yet another use of the payer volume data will be to construct payer dependency ratios to be used in the multivariate analyses of resident and other time trends. We are particularly interested if (1) high IRB, participating hospitals have experienced faster HMO penetration and, hence, be more financially vulnerable to GME rollbacks, and (2) resident reductions are greater in hospitals experiencing faster HMO penetration.

8.4 Revenue Changes

Several financial impact analyses are based on Exhibits 26 and 26a of the ICR dealing with revenues and expenses. These forms allow us to track changes in revenues decomposed by inpatient/outpatient, hospital routine, ICU, ancillary, home health, etc. They also support trend analysis of revenues from key nonpatient sources such as income from investments, unrestricted income from endowments, and contributions, donations, and bequests. Using these data, we will test the null hypothesis that participating hospitals did not increase the sources of nonpatient revenues in order to partially fund the revenue reductions. An analysis-of-variance framework will be employed to compare the change in percent of nonpatient revenues before and after the beginning of the demonstration in participating versus nonparticipating hospitals.

Gross charges and adjustments to charges by payer will be tracked by use of ICR Exhibit 46. HMO adjustments (disallowances), in particular, can be used to ascertain the degree to which managed care is putting pressure on revenues and operating margins through its discounting of charges. HMO discounts can be compared with state AAPCC carveouts

for GME to test the hypothesis that HMOs simply "reclaim" their lower premium by negotiating still lower hospital prices.

8.5 Cost Changes

ICR data will be used to track total hospital costs and hospitals costs by selected labor categories that are substitutes for residents such as physicians, house officers,[1] physician assistants, nurse practitioners, RNs, and LPNs. Resident costs will also be tracked. This analysis will show the extent to which hospital costs are affected by the demonstration. These costs can be stratified by level of Medicaid dependency, IRB ratio, hospital ownership, location, and AMC/COTH/other teaching status. Total costs can be obtained from ICR Exhibit 26 while labor costs by occupational group can be obtained from ICR Exhibit 35. Variants of the cost measure such as cost per discharge and cost per adjusted discharge[2] will also be tracked. (Decomposition of labor costs by occupational category will not be possible for the BBA demonstration.)

8.6 Operating and Total Margins

The most significant set of financial ratios, the operating and total margins, are also derived from ICR Exhibits 26 and 26a (Worksheets G-2 and G-3). A lengthy time series pre- versus post-demonstration on these key measures will be stratified by level of Medicaid dependency, IRB ratio, hospital ownership, location, and AMC/COTH/other teaching status. We will also stratify changes in margins by percent changes in each hospital's IME and DME payments, testing the null hypothesis that hospitals with larger reductions in GME payments did not experience greater declines in operating or total margins. Naturally, margins are, in

[1]During our site visits, it was indicated that *house officers* were being hired as partial replacements for resident reductions. House officers were characterized as medical school graduates (usually IMGs) that had not been accepted into a residency program but were willing to work in hospitals to gain experience so that they would have a better future chance to be accepted into an accredited residency program.

[2]*Adjusted discharges* refers to discharges plus an adjustment for outpatient volume.

part, influenced by how hospitals respond to the GME reductions. If margins appear unaffected, we will look for increases in the other sources of revenue.

8.7 Financial Solvency Ratios

Exhibits 23 through 29 in the ICR report Balance Sheet and Income Statement data necessary to evaluate changes in each hospital's financial condition. The forms give better detailed data than the Medicare Cost Reports on assets and liabilities and the various fund balances. Our ultimate goal will be to monitor changes in financial solvency and to put the GME rollbacks in financial perspective for each hospital.

The set of financial solvency ratios that will be monitored during the study include the Quick Ratio (current assets/current liabilities), days of cash on hand, the Debt Service Coverage Ratio, and the percent of buildings and equipment depreciated. Analyses of the fund balances will be conducted. Four separate funds are listed on the ICR: General, Special Purpose, Endowment, and Plant. Each has differing degrees of fungibility to cover losses. The General Fund balances will show the unrestricted net assets (e.g., cash, investments) on hand to cover losses. Total fund balances across all four funds is also important, however, as large endowments provide greater solvency either to take a risk and reduce residents or to ignore the changes are draw down on assets. Time trends in the general and total fund balances will be constructed and displayed in various ways by hospital group: participating/ nonparticipating, upstate/NYC, high/low IRB, high/low uninsured, etc.

8.8 Qualitative Analyses

HER staff are planning to conduct several case study visits to New York demonstration and non-participating teaching hospitals over the course of the evaluation. Staff will also visit a set of national hospitals participating in the BBA voluntary reduction program. We will also be interviewing teaching hospitals generally affected by the BBA mandatory provisions, probably as part of the national BBA S4626 control group.

We propose to interview each hospital's CEO, COO, CFO, Director of Managed Care Contracting, and their staffs regarding the financial status of the institution and the impact the Medicare GME rollbacks are having. We will develop an informal protocol with questions in a few general domains, including revenue and cost trends, trends in financial performance and ratios, revenue replacement strategies, etc. Particular emphasis will be given to how managed care is responding to the BBA and New York provisions to carve out GME payments and pay them directly to the teaching hospital. It is our hypothesis that managed care will attempt to "recapture" this carve out to the AAPCC by negotiating even deeper hospital discounts, knowing that facilities are receiving Medicare GME monies explicitly on the patients they direct to the institution.

9 Analyses of Medicare + Choice and Teaching Hospitals

9.1 Overview

Since the implementation of PPS in 1983, Medicare has paid a portion of both DME and IME costs incurred by hospitals. The DME payment is calculated by multiplying the hospital's per resident amount by its weighted number of FTE residents times the percent of inpatient days attributable to Medicare Part A beneficiaries:

(9-1) DME = (pay/resident)(#FTE residents)(Medicare days/total days).

The IME payment per case (IMEPAY) is based on the hospital's ratio of interns and residents to beds (IRB), with the adjustment factor multiplied by DRG payment for each case (including outlier payments but excluding disproportionate share payments):

(9-2) $IMEPAY = (DRG\ weight)(standardized\ amount + outlier)[(1 + (IR/bed))^{.405} - 1]$.

Thus, the total DME and IME payments a hospital receives depend on its number of Medicare discharges: IME as a direct add-on per discharge, and DME indirectly through the number of inpatient Medicare days.

Exceptions to these payment rules arose, however, for Medicare beneficiaries enrolled in a managed care plan. Prior to the BBA, HCFA capitated payments based on the AAPCC to managed care organizations included the GME payment that would have been made to hospitals had the beneficiaries remained in fee-for-service. Managed care organizations negotiated their own rates with hospitals and were in no way compelled to pass the GME component of the AAPCC along for inpatient care. As the proportion of Medicare beneficiaries enrolled in managed care increased, this "unguaranteed" GME payment policy

became more problematic. Hospitals argue that they incur indirect teaching costs for Medicare cases but are not being adequately reimbursed, creating an adverse financial effect.

The BBA makes two key changes that will affect GME payment for managed care beneficiaries. First, the new Medicare+Choice Plan greatly expands the managed care options available to beneficiaries. Current HMO/CMP risk contractors automatically transition into the new Part C Medicare+Choice, and new options such as Provider Sponsored Organizations are established.

Second, recognizing that the shift of more Medicare beneficiaries to managed care would exacerbate the issue of GME payments for these hospitalizations, the BBA introduces a new payment methodology. Direct and Indirect Medical Education payments will be "carved out" of the payments to plans and paid separately to hospitals incurring these costs for Medicare+Choice enrollees.

Section 4622 of the BBA specifies that the hospital is to receive an additional IME payment for discharges of Medicare beneficiaries enrolled in managed care plans. Prior to FY98, teaching hospitals received no government IME payments for beneficiaries in managed care. Payment is to be phased-in at 20 percent of the amount payable for a fee-for-service enrollee in FY98; 40 percent in FY99; 60 percent in FY00, 80 percent in FY01; and 100 percent in FY02 and thereafter. By FY02, hospitals will receive IME payments for managed care beneficiaries from HCFA as if they were fee-for-service enrollees.

Section 4624 of the BBA is the analogous section covering DME payments. It specifies that the hospital is to receive an additional DME payment equal to the product of the "aggregate approved amount" (the number of residents times payment per resident) and "the fraction of the total number of inpatient-bed days that are attributable" to individuals enrolled in managed care plans. Thus, it specifies that the hospital's DME payments for managed care enrollees are to be determined in a manner identical to the DME payments for fee-for-service beneficiaries. As was the case with IME payments, DME payments for managed care enrollees are to be phased in over a five-year period. In FY98, teaching hospitals will receive 20 percent of the amount payable for a fee-for-service enrollee. By

FY02, they will receive DME payments for managed care enrollees just as if they were fee-for-service enrollees.

This chapter is presented in three substantive sections. Section 9.2 lists the key policy questions relevant to BBA Sections 4622 and 4624. Section 9.3 describes our proposed tabular analyses followed in Section 9.4 by our qualitative case study plans.

9.2 Key Policy Questions

Research questions of interested related to these sections of the BBA include the following.

Section 4622:

1. How many more discharges qualified for IME payment? (J-1D)
2. Was HCFA able to collect encounter data for each of these newly reimbursable discharges? How much additional payment resulted? (J-1D)
3. How many hospitals benefitted from the additional payments? (J-1D)
4. Were teaching hospital negotiated rates from managed care plans modified on account of the "AAPCC" carveout? (J-1D)
5. Did the "carve out" affect the hospital's decision to reduce/maintain the number of residents? (J-1D)

Section 4624: [HCFA's RFP included the same 5 questions as for Section 4622 plus]

6. How has the count of Medicare inpatient days in teaching hospitals changed as a result of this provision? (J-1D)

9.3 Tabular Analyses

Unfortunately, questions related to the number of teaching hospitals admitting Medicare managed care patients, the number of discharges, and additional payments received by hospitals resulting from the "carve out" cannot be addressed using HCFA inpatient discharge files (MedPAR files). These files contain discharge abstract information on all Medicare discharges in fee-for-service or cost-based HMOs, but do not contain information

on discharges for patients in risk-contract HMOs. HCFA is collecting separate inpatient encounter data for managed care enrollees beginning in 1999. Although we will have a shorter time series, these data should be usable for tracking trends in Medicare managed care discharges. As a preliminary task, we will analyze the encounter data for accuracy and completeness. We will interview HCFA staff responsible for encounter data and implementation of Sections 4622 and 4624.

Assuming that HCFA is able to create files containing encounter data for managed care discharges, we will perform several types of tabular analyses for each year's data. Since many of the research questions are quite similar, we will have comparable tables for many of the DME and IME issues. For example, for each year we will track (1) how many teaching hospitals with at-risk contracts benefitted from the additional payments, (2) how many more discharges qualified for the payment, and (3) how much additional payment resulted. Each of these measures will be presented separately for DME and IME payments. For DME payments, we will also produce tables documenting the trends in Medicare inpatient days and the fraction of total inpatient days that are attributable to Medicare.

Question 4 on negotiated rates in light of the GME carveout from the AAPCC raises a subtlety often missed in an attempt to direct more of the premium to teaching hospitals. If managed care plans receive lower premiums from Medicare, they will be inclined to negotiate deeper discounts from hospitals.[1] At the same time, hospitals enjoying direct GME payments will be able to accept deeper discounts. How much of the direct GME payments teaching hospitals will be able to keep will depend upon the price elasticity of the supply and demand for patients. If teaching hospitals are willing to accept deeper managed care discounts (possibly due to strong local competition), then most, if not all, of the GME payment will flow back to the HMO. In this likely scenario, GME carveouts from the AAPCC provide short-run help at best for teaching hospitals.

[1]HMOs may also drop out of Medicare+Choice altogether if they cannot "make a profit" on the GME component of the AAPCC.

Tabular methods for analyzing this issue have already been described in Chapter 8. They involve measuring HMO discounts over time using New York State ICR data, stratified by hospital Medicare capitated discharges.

9.4 Qualitative Analyses

Information on decisions to negotiate with managed care plans or changes in hospital contracts with managed care plans will also be gathered through the case study method. We anticipate that several types of contacts will be helpful in addressing these issues. Discussions with hospital CEOs and CFOs would help us understand the factors behind these decisions. CFOs and managed care directors would be most helpful in learning details of actual contractual changes and implementation issues. Of particular interest is whether managed care plans are using GME carveout payments as a justification for even deeper discounts. We will ask hospital managed care directors as well about the local competitive market and how resistant they can be to threats in moving blocks of Medicare patients.

We also intend to interview a few plan negotiators in New York City and selected cities nationwide. We will ask how the plan responded to a lower AAPCC due to the carveout. Did they try to recapture some of it through deeper discounts? Were they successful? If so, under what circumstances?

10 Analyses of BBA DME Payment to Non-Hospital Sites and the Consortia Demonstration

10.1 Overview

As described earlier, under PPS, a hospital's DME payment is calculated by multiplying the hospital's per resident amount by its weighted number of FTE residents times the percent of inpatient days attributable to Medicare Part A eligible beneficiaries. If a hospital provided the opportunity for a resident to spend time in some other setting as part of the training program, at a free-standing clinic, for example, the hospital's number of FTE residents would decline. Since payments are based on the number of FTE residents, rotating residents through non-hospital settings would mean a reduction in DME payments for the hospital. In addition, non-hospital sites that provide residency training have historically not been allowed to receive DME payments.

The hospital-based payment mechanism has become increasingly at odds with pressures to change the training of new physicians. The rate of days of inpatient care for Medicare enrollees has fallen by 30 percent between 1985 and 1995, from 3,016 to 2,149 days per thousand enrollees (HCFA, 1996). This decreased reliance on inpatient hospital care and increased concerns about training more generalists and fewer specialists has led to increased interest in providing training outside the hospital setting. In 1995, the Council on Graduate Medical Education (COGME) recommended that DHHS "provide incentives for generalist training" and "remove the disincentives to conduct educational programs in such key nonhospital settings as physician offices, group practices, community health centers, and managed care facilities." (HRSA, 1995) In a recent survey of hospitals funded under The Pew Charitable Trusts' "Partnerships for Quality Education" initiative, 9 of 21 respondents indicated that they had fewer non-hospital training sites available than were needed, and 17 respondents indicated that no payment was made for off-site training. However, training

sites reported higher costs incurred from teaching due to the need for more exam rooms, more support staff, a greater number of tests performed, and less efficient scheduling. (Personal communication, David Nerenz, Henry Ford Health System)

Two sections of the BBA deal with the issue of payment to nonhospital providers. Under Section 4625, DME payments may be made to qualified non-hospital providers for their direct costs of medical education incurred in the operation of a residency program. Qualified non-hospital providers include (i) Federally Qualified Health Centers, (ii) Rural Health Clinics, (iii) Medicare+Choice organizations (such as HMOs), and (iv) other providers as determined by the Secretary.

While the Act specifies that "double payments" are prohibited and the count of hospital FTEs will be reduced to reflect residents working outside the hospital, for the first time payment will be available to cover DME in non-hospital settings. The law does not address how much these ambulatory care providers should be paid or the actual payment mechanism. It does, however, specify that funds go to the institution that incurs the cost of training.

Section 4628 of the BBA establishes a related demonstration project on the use of consortia. In this demonstration, instead of making payments to teaching hospitals in the usual manner, payments will be made to each consortium that meets the BBA requirements and applies to be included under the project. Qualifying consortia must include a teaching hospital with one or more approved medical residency programs and one or more of the following: (a) a school of allopathic or osteopathic medicine, (b) another teaching hospital, (c) a Federally Qualified Health Center, (d) a medical group practice, (e) a managed care entity, (f) an entity furnishing outpatient services, (g) such other entity as the Secretary determines to be appropriate. Consortia are not limited to including non-hospital providers as under Section 4625. In addition, the members of the consortium must agree to participate in the programs of graduate medical education that are operated by the entities in the consortium and must agree on a method for allocating the payments among the members.

The total payments to the consortium shall not exceed the amount that would have been paid for the teaching hospital (or hospitals) in the consortium.

Thus, the two sections of the BBA are related in that both allow payment to be made for graduate medical education that takes place outside the hospital, although Section 4628 also seeks to demonstrate strictly hospital-based consortia as well.

This chapter is presented in three substantive sections Section 10.2 lists the key policy questions relevant to BBA Sections 4625 and 4628. Section 10.3 describes our proposed tabular analyses followed in Section 10.4 by our qualitative case study plans.

10.2 Key Policy Questions

Research questions of interest with regard to these sections of the BBA include the following.

Section 4625:

1. How many, and what kind(s) of non-hospital providers qualify for Medicare payment of DME? What is the total amount of such reimbursements? (J-1D)

2. How many such training programs were developed/expanded as a result of this provision? How many more residents received such training? (J-1D)

Section 4628:

3. How many consortia from how many states applied for the demo? Were any applications rejected? Why? (J-1D)

4. Were there any estimated Medicare savings? (J-1D)

5. What kinds of structural forms do the consortia take? (J-1D)

6. How are revenues shared among consortia members? (J-1D)

7. Describe the decision-making processes in consortia. (J-1D)

8. How did resident training programs of consortia members change? (J-1D)

9. How were the decisions made to develop (or not develop) non-hospital residency programs? To what extent did hospital rely on entities with which they had previous affiliations in developing these programs? (J-1D)

10. What operational problems were encountered in making payments to non-hospital providers? (J-1D)

10.3 Tabular Analyses

We anticipate that HCFA will provide us with information on applicants to the consortium demonstration. From this information, we will produce tables including the number of consortia that applied for the demonstration, the geographic distribution of these applicants (by state, region), and the forms the consortia took (for example, how many include a second teaching hospital, how many include a managed care organization). If any applications were rejected, we will also document the number and characteristics of these applicants.

The BBA specifies that payments to consortia cannot exceed payments that would have been made to hospitals in lieu of their participation in the consortium. We will calculate the payments to hospitals under the standard payment rules and payments to the consortia. These will be compared to determine whether the demonstration resulted in any estimated Medicare savings. These results will be presented by totals annually, and by consortium.

For analyzing the effects of Section 4625, we anticipate that financial data on payments to non-hospital providers will be available from HCFA. Information on hospital costs associated with medical education is currently available from the Medicare Cost Report data. Presumably, once non-hospital providers become eligible to receive DME payments, similar data will be required by HCFA from these entities and will be available for analysis.

Using such data, we will produce tables showing the number of non-hospital providers (total and by type of provider) receiving DME payments in each year. We will also tabulate the total amount DME payments by HCFA to these providers, overall and stratified by type of provider.

10.4 Qualitative Analyses

Several of the issues related to the consortia demonstration are best addressed through case studies. Issues such as the decision to develop a consortium and create non-hospital residency programs, the process through which these were developed, and the hospital's satisfaction with the resulting program can best be addressed by talking with the involved parties. Similarly, issues relating the decision-making process in the consortia and the revenue sharing structure can be addressed during the case studies.

We anticipate speaking to several individuals affiliated with the teaching hospital(s) participating in the consortium, including the CEO, CFO, and director of medical education to learn why the hospital decided to enter the consortium and how the structure has evolved. We would also talk to representatives from other members of the consortium to find out why they entered into the arrangement, what they hoped to gain, and learn their views of the decision-making process within the group. The exact number of site visits will be determined after the consortia demonstration is implemented.

11 Analyses of Size and Composition of GME Enterprise Nationally and in New York

11.1 Overview

In recent years, numerous groups have concluded that there is a need to slow the growth in the total supply of physicians and to alter the mix of specialties, toward more generalists (family practice, internal medicine, pediatrics) and away from specialists (PPRC, 1996; HRSA, 1995; Physicians Weekly, 1997). The Council on Graduate Medical Education (COGME) has estimated that the U.S. could have a surplus of 100,000 physicians by 2015, if current trends continue (Physician's Weekly, 1997).

The BBA mandates limitations on the growth in Graduate Medical Education (GME) programs while extending the opportunity for hospitals with GME programs to obtain partial funding for voluntary reductions in the number of resident physicians in training. By reducing the number of residencies, while requiring that the proportion of residents in primary care may not be reduced, this legislation has the potential to achieve both goals: to reduce or halt the growth of physician supply and to shift the balance toward primary care providers.

Concerns about the oversupply of physicians have been heightened by the recent increase in IMG residents. In 1988, there were 11,556 IMG residents, which more than doubled to 26,783 in 1995. During the same time, the number of residents that graduated from U.S. medical schools rose by only nine percent, from 71,235 to 77,829 (COGME, 1997). This led to six associations, including COGME, the AMA, and the Association of American Medical Colleges, to call for a reduction in the number of IMG residents.

Changes in the nature of medical care have also led to changes in the nature of some residency programs. Among internal medicine training programs, 35 percent have reported making changes in their program to train more general internists by converting positions

from preliminary internal medicine (the prerequisite to subspecialty training) to primary care internal medicine (to prepare physicians to practice as internists), adding more ambulatory training time, and adding electives in areas such as women's health (PPRC, 1996).

Medical students have not been blind to changes occurring in the market for physicians. Although the predictions of an oversupply of physicians has not led to a decrease in medical school applications, graduating medical students have expressed an increased interest in generalist fields, and declining interest in certain highly specialized fields such as ophthalmology, orthopedics and anesthesiology (PPRC, 1996).

Given this background, and with many BBA restrictions being mandatory, determining which changes in graduate medical education are motivated by the BBA, and which are related to other hospital market and economic factors, is not an easy task. By examining market variables in which there is geographic variation, such as level or growth of managed care penetration, or state policies toward funding GME (United Hospital Fund, 1998), we may be able to establish a correlation between these factors and changes in hospital residencies. Variables that have been collected over time, such as the proportion of medical students expressing interest in primary care specialties, can be examined to see if the trend experiences a major change corresponding to implementation of the BBA.

This chapter on medical enterprise is in 6 substantive sections. Section 11.2 lays out the key policy questions listed in the RFP. Section 11.3 describes our tabular analyses of changes in residents for the nation as a whole. Section 11.4 describes our tabular analyses of changes in residency programs as distinct from resident FTE counts. These analyses are decomposed into national, consortia, and market area elements. Section 11.5 lays out our multivariate analysis plans designed to separate out the impacts of market and economic forces from BBA effects. Section 11.6 presents our plans for qualitative case study analyses to address subjective questions of interest. And Section 11.7 proposes a survey of state Medicaid programs to determine how they might be changing their payment for GME in response to BBA GME provisions or other factors.

11.2 Key Policy Questions

The following are the key policy questions mentioned in the RFP relating to general trends in medical enterprise:

1. Did many state Medicaid programs change their GME funding methods in apparent response to the new Medicare provisions? (J-1D; Overall)

2. How much did the overall size and composition of medical GME change from the 1997 base period? (J-1D; Overall)

Task B7 of the RFP further elaborates on these questions by requesting:

3. a discussion of the missions, goals, objectives, and programs of institutional providers that may have changed since the passage of BBA;

4. a comparison of BBA-induced changes with other hospital market and economic forces that may also have influenced changes in goals and programs.

11.3 Tabular Analyses of Changes in Residents

The first analysis will track the size and composition of the resident physician population in the United States from 1997 through 2000 (and beyond depending on data). Tabular analysis will present the number of resident physicians, overall, and by demographic characteristics including age, sex, race/ethnicity, IMG status, and type of medical school (osteopathic versus LCME-accredited allopathic medical school) for each year. We will also calculate the number of residents by specialty (or subspecialty) for each year. Much of this data can be gathered from individual reports issued by the American Medical Association (See for example, AMA's *Characteristics of Graduate Medical Education Programs and Resident Physicians, by Specialty*). However, in order to perform more detailed analyses, we will obtain two data bases that contain individual resident level information: the IRIS data and the AMA Census of Graduate Medical Trainees (CGMT).

Using the resident-level data will enable us to perform selected cross-tabulations for areas of interest that are not available in published tables of the AMA. For example, if we found that the number of residents in anesthesiology declined substantially during this time frame, we might also be interested in how the proportion of IMG residents in this specialty changed as compared with all specialties.

The number of IMGs and their location and specialty choices will be a major focus of this analysis. The results could be presented either as simple counts of numbers and proportions of residents, or through construction of the relative participation index (RPI) (Lowin, 1975). The RPI is a ratio of ratios. In this case it would be calculated as:

$$\frac{\text{(IMG residents in anesthesiology / all residents in anesthesiology)}}{\text{(IMG residents / all residents)}}$$

A ratio greater than one would indicate that IMGs are relatively over-represented in anesthesiology, compared with all specialties. A trend in the RPI toward 1.0 over time would indicate that the proportion of IMGs in anesthesiology is becoming more similar to the proportion in all specialties; as the RPI diverges more from 1.0, the proportions are becoming less similar. RPIs by IMG status, race/ethnicity, sex, and medical school type can easily be generated over time.

We will conduct this analysis for two samples of data: for first year residents only, and for all residents. Since we are examining a relatively short time frame, and residency programs run for three or more years, the distribution of first year residents will provide a clearer view of recent changes. For example, suppose all hospitals phased in a 10 percent reduction in the number of residency positions by reducing the number of incoming residents by this amount (but did not force any current residents to leave). The overall reduction in residents would be significantly less than ten percent, but the reduction in first year residents would provide a much clearer picture of the long-run trend.

The disadvantage of only looking at first year residents is that decisions made during the residency will not be captured. This is particularly important if we are to measure decisions to enter subspecialties. For example, one goal of COGME is to increase the

number of physicians in general internal medicine while reducing the number entering internal medicine subspecialties such as cardiology. Since training for these subspecialties begins after the residency in internal medicine is completed, trends in physician training in these fields requires looking at residents in the more advanced years of training. Therefore, if we obtain the AMA CGMT data over several years, we should be able to identify each resident's year of training and track subspecialty choices. This can be accomplished on an aggregate basis, without obtaining unique resident identifiers, by examining the change in numbers of residents in selected specialties for specific post-graduate training years.

11.4 Tabular Analyses of Changes in Residency Programs

The analysis described above utilizes the resident as the unit of analysis. Our second substantive area will examine residency programs using two approaches, one using the hospital as the unit of analysis, and the other using the sponsoring program as the unit of analysis.

Hospitals and medical schools face several options under the BBA: (1) maintain the status quo; (2) reduce the number of residents while offering the same specialty programs; and (3) reduce the number of residents by eliminating some specialty programs. Instances of hospitals opening new residency programs have been rare in recent years, although it is possible. For example, data from our case studies suggest that some hospitals or medical schools begin new sub-specialty programs when new faculty are recruited.

Information on a hospital level will be obtained by aggregating data from IRIS. Information on a program level can be obtained by aggregating information from the CGMT and from data published by the AMA "Green Book" (AMA's Graduate Medical Education Directory, available on CD-ROM). The "Green Book" will allow us to examine characteristics such as the number of filled and unfilled resident positions.

11.4.1 National Program Trends

For each year from 1997-2000 (or beyond if data and time permit) for the country as a whole, we will calculate:

- the number of hospitals and programs offering residencies, overall and by specialty;
- the distribution of number of residents per hospital and by program, overall and by specialty; and
- the distribution of number of specialties in which a residency is offered per hospital.

The first two calculations measure resident (as opposed to program) trends. The third bullet point addresses the extent to which reductions in residency programs leads to "specialization" in the training of physicians. For example, if we found that 40 residency programs had been eliminated, this analysis would tell us whether this was the result of 40 hospitals each dropping one program, or 10 hospitals each dropping four residency programs.

11.4.2 Consortia Program Trends

We will also document the behavior of hospital consortia. GME consortia emerged partly in response to increased merger and acquisition activities on the part of hospitals, and more recently, for the purposes of managing residency reductions in New York as part of the HCFA Demonstration. One consortium option would be to consolidate programs in fewer hospitals, eliminating some medical subspecialties in one hospital and some surgical subspecialties in another. Data on consortia and their characteristics are only collected on an ad hoc basis through special surveys by the Division of Medical Education at the AAMC. We will examine the extent to which consolidation occurs, as opposed to, say, reducing the number of residency slots while maintaining all programs in all affiliated hospitals. Case studies of individual consortia will also provide insights in this area.

11.4.3 Market Area Program Trends

The final analysis of residency programs will have a geographic focus. Namely, for each metropolitan area, we will determine the number of residency programs offered and the number of residents. This analysis is of interest because the impact of a residency closing or reduction may depend greatly on the number of other residency programs in the area, and whether these programs are also closing or becoming smaller. This approach is similar to that used in Dayhoff and Cromwell (1994) in an examination of the effects of diffusion of technology. For example, a single hospital's reduction of a program by 50 percent in Los Angeles or New York would have negligible effect on the total number of residents in the metropolitan area, while a similar reduction in a smaller city might have substantial impact.

11.5 Multivariate Analyses of Program Trends

The analysis described above documents changes in graduate medical education after 1997. In order to identify factors associated with changes, we will stratify hospitals by characteristics such as large urban/urban/rural, census region, hospital bedsize, ownership, teaching status (AMC/non-AMC), Medicare casemix index, Medicare dependency, disproportionate share status, occupancy rate, hospital market characteristics, and selected characteristics of the residency programs, e.g., number of unfilled positions. Bivariate analysis will indicate which of these characteristics are more/less likely to be associated with a hospital reducing its resident count or discontinuing a residency program.

These variables will subsequently be entered as independent variables in regression analysis using change in the hospital residency program as the independent variable. Until we observe the actual distribution of changes in residency programs, it is difficult to specify an appropriate form for the multivariate analysis. Possibilities would include: (1) a logit regression using change/no change in number of residents as the dependent variable; (2) a logit using change/no change in the number of residency programs as the dependent variable; (3) an ordinary least squares regression using the change in the number of residents as the

dependent variable. Because many hospitals or programs may not change the number of residents, numerous zero values could bias these regression results. If we find this to be the case, we will also explore using two-part models, where the second model is restricted to hospitals or programs that experienced a change in the number of residents. Unlike the regression analysis described in Chapter 4, the emphasis of this analysis is to identify characteristics of hospitals and markets that are associated with changes in residency programs (not to determine whether the BBA had an impact on these trends.)

In addition, we anticipate developing an expanded set of dependent variables to be included in the analysis. These would include measures of change at a more detailed level; for example, changes in the number (or proportion) of IMG residents, and changes by individual specialties or specialty groupings (i.e., surgery, RAPs). The exact specifications will be determined once the descriptive analysis is completed, so that we focus on variables showing substantial change during our time series.

11.6 Qualitative Analyses

The RFP calls for qualitative analysis of the changing goals, missions, and programs of teaching hospitals. This can be done either through a combination of mail survey and case study site visits. The advantage of a mailed survey to teaching hospitals would be the potential generalizability of the results. The major disadvantage would be the requirement for OMB clearance. We recommend at this point to use case study site visits instead. HER staff have already learned a great deal in their New York site visits regarding general BBA effects and changes in state GME funding (see Appendix B).

HER staff will already be conducting many site visits to teaching hospitals, nationally, in its evaluation of BBA resident downsizing initiatives. Among these will be several control hospitals affected only by the BBA. We propose to answer questions regarding changes in goals, missions, and programs by developing a detailed set of interview questions in these areas. The questions will be integrated into the protocol used for our outside-New York case studies.

The results of the case study responses will be synthesized into a chapter of the Medical Education Enterprise report. The purpose of this chapter will be to enhance our understanding of the statistical trends we will have reported earlier in the report.

11.7 Analysis of State Medicaid GME Funding

To our knowledge, no information exists on how each state Medicaid program funds GME. HCFA does have copies of state Medicaid plan amendments dealing with hospital payment. These may suffice for drawing inferences about GME funding, although they are bound to be inaccurate and slightly dated. As most states have now converted most of their eligibles to managed care, the whole question of GME coverage is much more complicated.

Therefore, we recommend a survey of all 50 state Medicaid programs, requesting explicit information on their GME funding via Medicaid. We would ask whether their program makes any explicit, direct GME payments (like New York). We would determine exactly how each state pays hospitals and whether GME is implicitly covered in the rates. Under conversion to managed care, any Medicaid GME payments explicitly directed to teaching hospitals have almost certainly been reduced if not eliminated. To provide meaningful answers to HCFA, we would need to determine how stringent were the negotiated rates that Medicaid HMOs with teaching hospitals. In our survey, we would ask knowledgeable state Medicaid staff how HMOs were negotiating rates with teaching hospitals, how concerned they were with adequate funding of teaching hospitals, and the like. We would also discover if any HMOs had shifted Medicaid eligibles out of teaching to less expensive community hospitals. We would be asking about state Medicaid staff's policy position regarding patient access to teaching hospitals as well.

12 Impact Analyses of Transition Payments on Medicare Outlays

12.1 Overview

In HCFA's original RFP, no questions were raised regarding the overall savings from the New York demonstration or from the national BBA programs. It was HER's understanding from conversations with the HCFA Project Officer that HCFA staff would take responsibility for calculating any savings from downsizing GME programs under the New York demonstration and BBA programmatic changes. HER staff were asked, however, to consider the impact of residency reductions upon the billings and revenues of teaching hospital faculty and any changes in hospital ancillary and indirect costs. These concerns naturally relate to the question of overall Medicare savings from the New York demonstration and the BBA provisions.

Thus, in this chapter, we lay out a couple of approaches to quantifying the impact of transition payments on overall Medicare outlays. The rest of the chapter is in five sections. Section 12.2 presents the questions we intend to answer if HCFA approves our analysis plan. Section 12.3 describes a simplified cost-effectiveness analysis relating transition payments to changes in residents. Section 12.4 adjusts crude estimates of total Medicare savings in IME and DME outlays by substituting narrower econometric estimates of Medicare-related resident reductions for absolute declines in residents. Section 12.5 addresses the methods to be used to measure changes in Medicare Part B outlays for physicians while Section 12.6 concludes by suggesting a method for measuring changes in ancillary costs due to resident downsizing.

12.2 Key Policy Questions

The following are key policy questions we propose to address in analyzing the impacts of transition payments on Medicare outlays:

1. What impact did residency reductions have on the billings and revenues of teaching hospital faculty?

2. Did ancillary and hospital indirect costs change as a result of non-physicians substituting for medical residents?

3. What was the government's cost in terms of transition payments to achieve a reduction of one resident in the New York demonstration or BBA voluntary reduction program?

4. What was the government's total cost savings due to resident reductions in response to transition payments and mandatory provisions?

The first two questions were raised by HCFA staff in their review of HER's proposal. The concern is that resident reductions, while saving on IME and DME outlays, should increase the Part B billings of attendings who substitute for residents. Concern over hospital ancillary and indirect costs is quite different given that Medicare covers such costs under a fixed prospective DRG rate. Thus, any cost increases from fewer tests or shorter stays, or any cost increases from substituting other personnel, do not affect Medicare outlays directly. They can affect hospital costliness and financial performance, however.

Question 3 treats the voluntary reduction initiatives as short-run assistance in order to avoid greater Medicare expenditures in the long-run. A natural question is how costly to Medicare is the incentive of transition payments in reducing residents. Question 4 simply totals the per resident savings while factoring out changes in residents unrelated to the transition payments or BBA mandatory provisions.

12.3 Cost Effectiveness Analyses

As part of the demonstration, the government may be interested in knowing not only how many resident positions were eliminated as a result of offering transition payments but also how cost effective (CE) the payment policy was. At one level, this is a straightforward question. A simple CE ratio can be calculated as:

(12-1) CE = Transition outlays/ change in residents.

Transition outlays will be based on total DME and IME payments paid out to New York demonstration and BBA Section 4626 participants adjusted for reductions mandated by BBA. These numbers are readily available from the New York FI and from other FI's for the national demonstration.

The change in residents, however, can be counted in two distinctly different ways. First, the total reduction in each non-dropout hospital's FTE residents over the demonstration period is one measure. While hospitals are required to reduce residents by 20-25 percent, successful participants may actually exceed these goals. Their total change numbers would appear in the denominator of this "actuarial" CE ratio.

This measure, however, will inevitably overstate the CE of the transition payments because successful participants would have made some reductions in resident counts without any transition payments. This is a natural consequence of (a) BBA-imposed reductions in GME Medicare payments, and (b) reductions in GME payments by other payers in New York. Case study interviews with New York hospital staffs have revealed that they had intended to make resident reductions in any event based on payment reductions, declining inpatient volumes, weak programs, etc. A truer measure of the real change in residents due solely to transition payments requires econometric analyses holding other variables constant. For example, if we find that only 5 percent of the resident reduction can be attributed to the transition payments, not 20-25 percent, then the true CE ratio is 4 times greater than the actuarial estimates.

It is HER's understanding that HCFA would like to include summaries of annual demonstration site progress reports as evaluation deliverables. In this case, these reports would include distributions of transition payments for meeting interim and final targets. Thus, we will already have the numerator of the CE ratio. We will also have the actuarial estimate of changes in residents based on our access to the IRIS FTE resident counts by hospital. Hence, we can readily provide estimates of the first of the two CE ratios. Finally, for the final report as part of HER econometric evaluation, we will also derive estimates of the marginal contribution of transition payments to resident reductions. These marginal

estimates, applied to continuous participants, can provide the second estimate of true, demonstration-induced, resident reductions. These estimates will be used to generate a second CE ratio on an adjusted basis.

12.4 Total Cost Savings Analysis

Another meaningful way of evaluating the financial success of government transition payments is in terms of net total savings. HER will calculate such measures based on the net foregone IME and DME revenues incurred by participants (see Appendix A.5 for how these measures would be calculated). Net foregone payments incurred by hospitals are equivalent of the savings enjoyed by Medicare from resident reductions.

But again, these measures credit all of the reduction in residents to the transition payments. Thus, we propose replacing the end-period actual reduction in residents with an estimated figure based on the econometric analysis.

12.5 Analysis of Medicare Part B Physician Outlays

To the extent that attending physicians end up substituting for residents, there will be an increase in faculty practice plan revenues as these physicians bill for those services formerly provided by residents.[1] Types of service most likely to see increased physician billing include: inpatient hospital visits, assistance at surgery, ER and OPD visits, and special tests done on night call.

We propose to obtain Part B bills associated with all New York demonstration and control hospitals in order to evaluate any offset to Part A savings associated with fewer residents. Performing the analysis for the BBA demonstration nationwide would require enormous resources and is not recommended. We will use the same methodology as was used in HER's prior study of teaching physicians, but we will expand the data collected to include Part B physician bills for ER and OPD visits as well as institutional OPD claims.

[1] One CEO in New York City reportedly pointed out to his attendings the possible increase in faculty billings as a way of softening the impact of resident downsizing. See Appendix B.

There will not be any Part B bills submitted by physician faculty in cost-election hospitals (which include all of the New York City Health and Hospital Corporation hospitals). However, we can identify physician costs in these hospitals from their cost reports and can track these costs over time.

We propose the following steps:

1. For all Medicare beneficiaries with a PPS inpatient claim, pull all of their physician claims. Do this for both pre- and post-demo years and for both participant hospitals and non-participating hospitals in the NY GME demo.

2. Define inpatient episodes.

3. Associate physician claims with the inpatient episodes.

4. Calculate Part B allowed charges (or payments or RVUs) per episode, by DRG for each year.

5. Construct casemix-adjusted Part B allowed charges per episode for each participating hospital and non-participating hospital for each pre- and post-demo year.

6. Compare the casemix adjusted Part B allowed charges per episode of participating hospitals to non-participating hospitals.

Certain limitations exist with the proposed analysis. First, the above methodology will not account for the possibility that resident reductions might result in some patients being seen in off-campus physician offices instead of outpatient settings. Second, New York results might not generalize to the rest of the country. Another limitation would be that increased physician expenditures by Medicaid and private insurors, especially managed care organizations, are ignored. Hence, limiting the attending billing offset to just Medicare likely overstates the net savings to all payers as attending billings increase for other payors.

12.6 Analysis of Hospital Ancillary Costs

While we hypothesize that faculty practice plan revenues will increase under the demonstration, the net impact of substitution on ancillary costs, HCFA's second concern,

is less clear. If hospitals need to hire new personnel to perform tests that residents had been doing, or to cover patients at night, then costs would increase. On the other hand, fewer residents could actually lower costs, as fewer tests are ordered, operations and stays become shorter, etc. We propose to examine ancillary cost trends using SPARCS data and NYS Institutional Cost Reports. For the BBA residency reduction demonstration, the analysis would be limited to Medicare patients, using MEDPAR and Medicare Cost Reports. Departmental cost-to-charge ratios will be constructed and used to calculate ancillary costs per admission. These analyses must be done on a patient-level basis (rather than hospital-wide) in order to control for changes in case mix over time.

Revenue center charges on all-payor SPARCS-based or Medicare claims (for BBA) would be multiplied by departmental cost-to-charge ratios, then summed, to produce an estimate of total ancillary costs per patient. Tabular analysis would then be conducted comparing mean ancillary costs per discharge for study versus control hospitals before and after the start of the resident reduction initiative. Econometric analysis would extend the tabular work and follow the methods laid out in Chapter 7 on quality, which also uses patient-level SPARCS data. In short, patient ancillary costs are regressed on DRG, a time trend, a dummy variable indicating a participating hospital, and interaction terms for time and participation status to test for differential ancillary growth in hospitals voluntarily reducing residents.

13 HCFA Goals & Objectives and Influence of New York GME Demonstration on Policymakers

13.1 Overview

This chapter combines two survey efforts of federal personnel involved in various ways with either the New York Demonstration or the BBA GME payment reforms. The Greater New York Hospital Association (GNYHA) initially proposed to HCFA a funding mechanism to ease the anticipated financial impacts of reductions in Medicare IME and DME payments. HCFA staff saw the opportunity of conducting a demonstration that would provide transition payments to New York teaching hospitals if they agreed to make substantial reductions in their resident counts. This led to negotiations between HCFA and the GNYHA that produced a final set of terms and conditions of participation in the demonstration. Given the very short time frame for hospitals to join the demonstration, and the fact that key HCFA staff have taken on other responsibilities, HCFA staff responsible for the evaluation are interested in codifying the original goals and objectives of the demonstration and pinpointing any potential problems earlier staff may have expected as the demonstration evolved.

Once the New York Demonstration was implemented, Congress passed the Balanced Budget Act a few months later. Given the similarities between the New York GME demonstration and the BBA Voluntary Reduction Program, it seems clear to the outside observer that federal policymakers were influenced by the New York demonstration in drafting the BBA legislation. HCFA is interested in learning the extent to which this actually occurred. Presumably, there were certain aspects of the New York demonstration that policymakers specifically wanted to include in the BBA and other aspects that they rejected for national GME policy. To determine this, we will conduct a series of interviews with federal policymakers who were involved in developing the BBA provisions.

The chapter is presented in four substantive sections. Section 13.2 repeats the content of the set of policy-maker reports requested by HCFA. Section 13.3 describes the development of two interview protocols for collecting the desired information from HCFA staff and outside policy makers. Section 13.4 describes the HCFA staff we would expect to interview. Section 13.5 provides a list of individuals that we suggest interviewing regarding their interest in and knowledge of the New York GME demonstration.

13.2 Key Policy Questions

HCFA's RFP listed one question regarding the study of the impact of the New York Demonstration on policy makers:

1. Did the demonstration impact the national health hanpower concerns and recommendations of groups such as COGME, the AAMC, the AMA, the MPAC, etc.? (J-1C)

Tasks A1, A4 and A5 of the RFP describe HCFA's general requirements for two surveys of HCFA staff and national policy makers:

2. Prepare a report on the expressed goals and objectives of the HCFA in formulating and implementing the New York GME payment demonstration and the contractor's plans for evaluating the extent to which these are met, and any consequences and concerns that resulted in the near term. (A1)

3. Investigate and prepare a report on the extent to which national policy-makers outside of HCFA were influenced by the New York Medicare GME demonstration when developing the provisions in the BBA of 1997 that changed Medicare's payment policies for GME. (A4)

4. Investigate and prepare a report describing the kinds of information wanted by national policy makers outside HCFA about the New York Medicare GME demonstration, and the extent to which the operating data from the demonstration will be able to provide the desired information. (A5)

5. Discuss strategies for acquiring additional information sought by national policy-makers. (A5)

13.3 Develop Interview Protocols

HCFA Interviews. The interview protocol with HCFA staff would have two broad topic areas: (1) Goals and objectives; and (2) concerns of staff over demonstration performance over the first two years. In the first domain, questions would address what staff expected to learn from the demonstration, how the negotiations evolved with GNYHA, what questions of definition, measurement, and reporting were raised by hospitals, how the resident reduction targets and transition percentages were set, and the like. HCFA perceptions about the general oversupply of physicians would be gathered, how aware staff were of over- versus undersupplied specialties, what the level and specialty distribution of New York residency programs were compared to the nation, and what thought was given to targeting oversupplied specialties. Given the unique patient market many New York hospitals serve, we would ask HCFA staff about their familiarity with such markets and what objectives and expectations they had regarding the impacts of fewer residents on patient care. We would record HCFA staff's understanding of the scope of authority they had in designing the demonstration, setting overall targets and glide paths, defining specialties, and the like. HCFA staff's objectives concerning the downsizing and consolidation of programs would be pursued and their interest in residents' educational experience.

Concerns over hospital performance in achieving their reduction targets would also be gleaned from HER's HCFA interviews. Our design report contains numerous impact areas. Do HCFA designers of the demonstration believe we have missed an area of concern? What are their major concerns: Simply failing to meet the targets, or serious declines in access and quality--particularly in safety net hospitals? Given the large number of withdrawals and several participants failing to stay on their glidepath, are HCFA staff surprised, and if not, why? What are their feelings about modifying the terms and conditions in certain respects--especially now that the BBA invokes slightly different conditions in some areas?

Non-HCFA Interviews. Before conducting the set of non-HCFA interviews, HER staff will develop an informal interview protocol to be used with various policy makers. The

survey instrument will include questions regarding Congressional staff knowledge and involvement in launching the New York demonstration and how its terms and conditions molded national BBA policies for the voluntary resident reduction program. Additional interviews will be conducted with more technically oriented staff at CBO, MedPAC, etc. While these persons are not direct policy makers like Congressional representatives and their staffs, they do have considerable influence on GME policy development. A set of more technical questions will be developed on particular GME issues, transition payment glidepaths, treatment of consortia, etc., with research staffers.

13.4 List of HCFA Staff

We assume that our HCFA Project Officer will identify the key staff that we should interview. We imagine that they would represent at least four areas. First, we would likely talk with HCFA staff responsible for the initial negotiations with GNYHA over the demonstration terms and conditions. Second, we would likely interview key senior HCFA decision makers on the design of the demonstration, any interactions with Congressional staff, and their perceptions of how the demonstration is proceeding and what disputes have arisen. Third, we would likely talk with the demonstration's current project staff, including HCFA's liaison with GNYHA and those responsible for collecting and monitoring performance. And fourth, we would likely talk with our own evaluation project officer and staff about their objectives and any concerns they have in evaluating the demonstration--especially with the number of withdrawals that have occurred.

To complete this task within the first six months as requested, we would need a complete list of interviewees from our project officer as soon as possible.

13.5 List of Non-HCFA Policy Makers

The types of individuals who would be interviewed include the following:

- New York State Congressional delegation, particularly Senator Moynihan and his staff, including Mr. David Podoff. Also staff for Senator Charles Schumer and Charles Rangel.

- House Ways and Means staff, especially Dean Rosen, Anne-Marie Lynch and Linda Fishman.
- Senate Finance staff, especially Julia James, and Kathleen Fishman.
- Staff from Congressional support and advisory agencies, such as CBO, CRS, and MedPAC (including Gail Wilensky, Joseph Newhouse, Craig Lisk, Stuart Guterman, Donald Young).
- Staff from Federal agencies outside HCFA that also are concerned with physician manpower issues, such as HRSA and current and former members and staff of COGME (David Sundwall, Ed Salsberg).
- Other Congressional staff, including David Nexon from Senator Kennedy's office, Sue Rantham from Senator Frist's office.
- Staff from Congressional support and advisory agencies, including Murray Ross from MedPAC and Linda Bilheimer from the Congressional Budget Office. CBO may be particularly interested in the extent to which residency positions are cut and how quickly, for example, as this could have implications for budget projections.

Although a number of staff (particularly Congressional staff) may no longer be in their former positions, we will contact them at their current jobs.

After completing the set of policy-maker interviews, HER staff will review all of the data bases available in New York and evaluate their adequacy for addressing policy makers' concerns.

14

Description and Evaluation of the Administrative Mechanisms of New York's GME Demonstration

14.1 Overview

Setting up and maintaining a voluntary resident reduction demonstration is a major challenge. First, HCFA must negotiate terms and conditions with applicants. A number of definitional questions must be addressed in the terms and conditions, including what specialties make up primary care, what providers might be excluded from the resident FTE counts, how in- and out-rotations are counted, and how mergers and consortia will be defined and measured against glidepaths. Second, it must monitor the performance of participants in achieving their reduction targets as well as the impact any reductions had on patient care and resident education. And third, HCFA must adjudicate disputes of several kinds.

In evaluating the government's performance in administering the New York and national BBA resident reduction initiatives, we will apply both efficiency and equity criteria. Efficiency in administration concerns the promptness and accuracy of adminstration, including the timeliness of responses to queries and requests of participants and how quickly HCFA determines whether sites have met their annual targets and how quickly they are paid their transition payments. Equity in administration requires that HCFA be "fair" to both participants and to non-participants who decided not to participate. Fairness to participants requires an evenhanded treatment of all participants, including giving all participants opportunities to appeal decisions and adequate time to consider their decision to join the demonstration. Fairness also demands that the terms and conditions of participants in the New York demonstration be consistent with the rules applied in companion demonstrations or programs to reduce residents elsewhere in the country.

Being fair to non-participants has been particularly challenging to HCFA. Several participants have requested changes in their negotiated terms and conditions. HCFA has

rejected some requests out of fairness to non-participants who may have wished to participate under alternative terms and conditions. Furthermore, HCFA must constantly guard against giving participants any untoward competitive advantages other than might accrue naturally to downsizing their residency programs.

The rest of this chapter is presented in four substantive sections. Section 14.2 lays out the key policy questions to be addressed. Section 14.3 describes our plans for evaluating the reporting mechanisms required by HCFA of participants. Section 14.4 gives our plans for evaluating how HCFA monitors site performance and adherence to the terms and conditions. Finally, Section 14.5 lays out our evaluation strategy for describing and analyzing HCFA's resolution of disputes.

14.2 Key Policy Questions

HCFA's RFP provided one overall question regarding the evaluation of demonstration administration:

1. How successful were the reporting mechanisms, monitoring functions and the alternative dispute resolution process that were developed and used in the demonstration? (J-1C)

An operational definition of "successful", we suggest, could include the following:

- performance measurement is accurate;
- rules & reporting requirements are as simple as possible;
- performance measures as easily verifiable; and
- terms & conditions are not gamable.

Accuracy in measuring resident counts is complicated by HCFA's use of FTEs rather than program slots as the principal performance measure. Thus, both in- and out-rotations are included as adjustments to hospital-based programs. Moreover, week by week and month by month accounting of resident time by location is required. Simplicity in reporting is desirable to avoid misunderstandings and excessive reporting burdens. Verifiability is

related to accuracy and concerns the ability of HCFA to monitor performance in key areas. Gamability is always a concern of HCFA's. Are there hidden incentives in the terms and conditions that encourage and allow sites to avoid the main goal of the demonstration or otherwise behave in ways antithetical to HCFA's overall program goals?

To HCFA's primary question, we add the following policy questions:

1. Did the terms and conditions and administration of the demonstration address the government's overall concern of oversupplied specialties that should be downsized? Was the demonstration specific enough in targeting over- and under-supplied specialties?

2. How has HCFA/FI staff used the reports submitted by the sites to identify problems?

3. Were the monitoring functions adequate to detect significant reductions in patient access and quality? In financial viability?

4. What requests for changes in participant terms and conditions arose during the demonstration and what justifications were given sites for HCFA's decision regarding disputes?

14.3 Evaluation of Reporting Mechanisms

Annual progress reports from the sites contain 8 questions regarding the perceptions of sites of their downsizing efforts, challenges they have faced, problems with their terms and conditions, changes in patient care delivery, changes in resident rotations, future plans, and the adequacy of support they have received from the government. The reports also include a set of tables reporting resident reductions by specialty, financial performance, volume statistics, and the IMG share of all residents. Separate tables are reported by each consortium member.

In conducting our initial site visits to New York, HER staff have already reviewed the forms HCFA requires sites to use in reporting changes in residents and other statistics. HER staff will conduct a second, closer review of these forms, evaluating the scope of content, clarity of definitions, and how the data are used for monitoring performance. Staff will then review the submissions of sites for their completeness and how HCFA's Fiscal

Intermediary (FI) deals with incomplete information. One immediate problem with the reporting forms is the inability of the government to identify financial performance of individual hospitals within the Health & Hospitals Corporation; only integrated financial statements are provided. This prevents HCFA from identifying a "failing" HHC site that could need assistance with its glidepath.

We will interview HCFA and FI staff regarding the accuracy of the data and the ways in which the government uses the data for monitoring purposes. We will describe HCFA's goals in requesting the various pieces of information and how HCFA staff are reviewing the reports in identifying possible failures at the sites. We will describe variances in the manner in which sites report their subjective impressions of performance and how HCFA uses these subjective reports. We will interview participants regarding the simplicity, clarity, timeliness, and accuracy of the reporting mechanisms.

We will evaluate the timeliness of reports in two respects. First, does the semi-annual or annual time schedule of reports meet HCFA's "need-to-know" requirements? What does the HCFA/FI do with the July-December data? Second, does HCFA and the FI review all the reports in a timely manner when submitted?

14.4 Evaluation of Monitoring Functions

Once reports are submitted by the sites, HCFA and the FI must monitor performance. It is not entirely clear how much evaluation HCFA/FI staff are expected to do of site performance and how much the independent contractor is expected to do. Nor is it clear how much of the contractor's evaluation of performance is to depend upon site reports to HCFA and the FI. Determining the appropriate split of HCFA/FI and contractor monitoring activities will be the first task of this part of the evaluation.

HER staff will interview the HCFA Project Officer and FI staff on their routine monitoring of the submitted reports, e.g., how often do they review the reports, what problems have they identified, how have they responded to potential problems? We will also

determine how familiar HCFA/FI staff are with the situation and performance of participants. Areas we expect HCFA staff to be most concerned about include:

- changes in FTEs;
- financial solvency; and
- changes in inpatient/outpatient volumes.

Of greatest concern is HCFA/FI monitoring of sites regarding their glidepath, or reduction targets. HCFA also requests income and balance sheet data. How does HCFA analyze such data? What criteria does HCFA/FI staff use to identify financial problems?

The final aspect of monitoring performance is HCFA/FI follow-up on identified reporting problems. These can be classified as (a) problems of definition and accuracy, and (b) problems in performance. For sites that appear to be misreporting information, we will interview both HCFA/FI and site staffs regarding steps taken by the government to address the problem and how satisfied both sides are with the solution. For sites that HCFA/FI staff identify as having problems, we will describe the follow-up steps taken by the government to improve performance and how HCFA/FI staffed worked with site staff to correct problems. In most cases, this will involve "missed targets" on the glidepath. Of particular interest is what steps government staff took to assist sites to achieve their reduction goals.

To further evaluate HCFA/FI reporting and monitoring activities, HER staff will conduct an independent review of all site reports and identify possible inaccuracies and performance problems. Staff will then discuss with HCFA/FI staff their awareness of the problem and how they addressed it, if it was, in fact, a problem at all.

14.5 Evaluation of Dispute Resolution

As a first step, HER staff will list the substantive nature of all queries and requests submitted to HCFA for consideration and adjudication. We are already aware of a few of the requests, such as excluding dental residents from the site's FTE count and altering the definition of what constitutes primary care. Sites have also requested changes in their glidepaths and asked for clarification of the terms and conditions when some but not all

members of a consortium drop out of the demonstration. And most significantly, sites have contested the FI's count of FTEs. The final list will be provided as a contextual table with a brief description of the query or request, the date of submission, date of HCFA's decision or response, the general category of the request (e.g., FTE count, scope of inclusion), and the site making the submission. The list will be organized by year by site. Additional tables will summarize the various types of requests by category. Another table will list all actual changes in terms and conditions by site.

HER staff will interview participants on the rationale for their queries and requests for changes in their terms and conditions. We will, in turn, interview HCFA decision makers on the reasons for rejecting or agreeing to site requests for change. Armed with this information, we will provide a brief synopsis of the issue and pros and cons for making the change. Not all requests will be evaluated as many will fall within the same general category.

A final topic of our interviews will be recommendations for general changes in demonstration terms and conditions. Both HCFA/FI and participant staffs will have had extensive experience with the challenges of both reducing residents and monitoring performance. We will ask both staffs what changes they would recommend in the terms and conditions, as well as the reporting mechanisms, to better achieve overall public goals. For example, participants may recommend more flexibility in defining a primary care target depending upon the site's baseline primary/specialist ratio. HCFA/FI staff may agree with the concept and propose a more flexible alternative.

15 Recommendations for Technical Advisory Panel (TAP)

15.1 Overview

HCFA, in its RFP, requested that the contractor make "recommendations for establishing a Technical Advisory Panel of up to 6 recognized experts to guide the conduct of the evaluation work." From this description, it was not clear whether the panel was to provide general policy guidance and input from a few interested groups or to provide more narrow technical guidance in the conduct of the analyses. We now know that technical input was HCFA's intent. To that end, this brief chapter provides our recommended list of candidates for the panel and the rationale for their inclusion. It is also our understanding that HER will be able to add to its own consulting staff individual experts it feels would add to the quality of the actual research activities. These individuals will be proposed when negotiating the second phase of the contract.

The work of the panelists is distinguished from collaborative consultants by the extent of involvement. Under Task A11 of the RFP, the panel is to meet at least 5 times "to critique the contractor's evaluation methods, review and comment on preliminary results, and provide guidance for the evaluation work." Thus, each panelist would have a very limited role of primarily reacting to HER reports. Consultants, by contrast, would spend time working alongside HER staff in designing and conducting the research.

Section 15.2 lists the criteria for panelist selection. Section 15.3 provides the list of candidates and our recommendations organized by substantive area.

15.2 Selection Criteria

In developing our list of potential TAP members, we have identified several key categories for which we would recommend having representation on the TAP:

Marvin Dunn, M.D., director of medical education;
Harry Jonas, M.D., assistant vice-president for medical education;

- Council of Graduate Medical Education (COGME):
  David Sundwall, M.D., chairman
  David Kindig, M.D., Ph.D., former chairman

- Association of Academic Health Centers (AAHC):
  Roger Bulger, M.D., president
  Marian Osterweis, executive vice-president

We recommend that either **Dr. Whitcomb** or **Dr. Griner** from the AAMC be selected to represent all GME provider organizations. We believe they are highly knowledgeable on GME issues and either would be an articulate spokesman for the medical schools and GME providers. We also recommend **Dr. David Sundwall,** representing the national COGME. Dr. Sundwall would be a very interesting counterpart to the AAMC representative. Dr. Sundwall's group has responsibility for evaluating physician oversupply and appears to be an advocate for downsizing the physician workforce to better conform to the country's needs. He is also expert on technical issues surrounding resident educational requirements and specialty geographic distribution.

Dr. Bulger, representing the AAHC, would also bring an interesting perspective given his group's support of non-physician personnel who can substitute for residents in patient care. We intend to interview him as well as representatives of the AMA in fulfilling our requirement to talk with national policy makers and experts.

Medical Workforce Experts: [Possible Candidates]

- Fitzhugh Mullan, M.D., former director of the Bureau of Health Professions, HRSA;

- Edward Salsberg, Ph.D., director, Center for Health Workforce Studies, SUNY Albany;

- Mary Mundinger, R.N., Ph.D., Columbia School of Public Health.

All three possible candidates could contribute in different ways. We recommend **Mary Mundinger, Ph.D.,** because of her outstanding reputation on nursing workforce issues. We believe it is critical for the panel to have direct input from the nursing community. Dr. Mundinger will be very familiar with the roles of residents and nurses in teaching hospitals and how they might change due to downsizing. Naturally, her intimate familiarity with New York City hospitals is an added strength. (Her university hospital is a non-participant in the demonstration.)

It is HER's intention to approach Edward Salsberg to consult with HER staff on specific labor force issues. In this capacity, he would play a greater role than as a technical advisor.

Access/Quality of Care Experts: [Possible Candidates]

- Lisa Iezzoni, M.D., Harvard Medical School and Beth Israel Hospital;
- John Billings, J.D., M.P.H., Wagner School of Public Service, NYU;
- Arnold Epstein, M.D., Harvard Medical School and Harvard School of Public Health.

Of the three candidates considered for the review of HER's evaluation of access and quality, we recommend **Mr. John Billings**. Mr. Billings is currently involved in evaluations of access to care in safety net hospitals in New York and is nationally recognized for his work on avoidable admissions. No one is more knowledgeable about access issues surrounding New York hospitals and how resident downsizing might affect the care of the uninsured.

We intend to approach Lisa Iezzoni to assist us as a consultant in conducting the research on complications and quality of care.

Economists with GME Research and Policy Expertise: [Possible Candidates]

- Alan Dobson, Ph.D., The Lewin Group;

- Stuart Guterman, Ph.D., Urban Institute;
- James Reuter, Ph.D., Georgetown University Medical Center.

HER is already well endowed with health economists. Nevertheless, we believe our knowledge can be strengthened by the addition of at least one other expert who has been studying the financing of GME and is well versed on the nuances of Medicare IME and DME payment. For this panel role, we recommend **James Reuter, Ph.D.** Dr. Reuter has recently completed a simulation of the financial impact of the BBA on teaching hospital finances for the Commonwealth Fund. He also brings a deep understanding of Congress and the needs of policy makers.

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Appendix A

A

Model of Hospital Demand for Residents

A.1 Model of Resident Demand and Hospital Willingness To Participate in a Resident Reduction Demonstration

In this appendix, we develop a theoretical model of hospital demand for residents and, by extension, the institution's interest in downsizing its residency programs given recent BBA and other changes. The ultimate goal is to identify variables that may confound the effects of the transition payments so they can be explicitly controlled for.

A.2 The Hospital's Derived Demand for Residents

Residents, like other hospital inputs, can be considered as a derived demand based on the institution's goals, or missions, and constrained by their role in providing patient care. In a simple profit maximizing model, residents would be used to the point where their valued marginal product equals their effective wage rate. It seems inappropriate, however, to assume strict profit maximizing behavior for teaching hospitals that have a separate mission of training new physicians (and other allied health personnel).

Consider the following model that has the hospital maximizing utility as a function of output and the number of residents subject to a financial breakeven constraint:

(A-1) MAX: $U = u[Q, R]$

subject to

(A-2) $\pi = RV - C >= -S$

where U = aggregate hospital utility (including physician goals), Q = discharges, as a proxy for output, and $R = \sum R_j$= the sum of number of residents across j- specialties, π = the hospital's total margin, RV = operating revenues, C = all provider costs (including salaried

and contract physicians), and S = nonoperating revenues (including investment income and bequests).

The teaching hospital's "mission" in the utility function is captured by the number of discharges and the number of residents in the program. Institutions are hypothesized to seek to increase discharges in order to meet community health needs. (Discharges is a simplified proxy for a multidimensional output vector that would also include outpatient services.) They trade off this goal, if at all, in their preference function with the size of the teaching program, which is proxied simply by the count of residents. A utility maximizing function has definite implications for predictions of teaching hospital behavior in response to changes in GME funding, HMO growth, etc., as we will show.

Further, we assume the institution is constrained in achieving these dual goals by requiring that operating margins (RV-C) can be no less than nonoperating revenues, most of which derive from bequests. As one nun in a Catholic hospital once put it, "no margin, no mission."[1]

Further constraining the hospital is a production function relating discharges of the i-th type to residents, R_{ji}, and other inputs:

(A-3) $Q_i = f_i [R_{ji}, N_i, MD_i, K_i]$ $\quad i=1,...g$

where R_{ji} = number of residents in the j-th specialty treating patients of i-th type, N = the number of nurses, MD = the number of attending physicians, and K = a vector of all other inputs (e.g., orderlies, drugs). The g different casemix production functions explicitly recognize the direct, and likely varying, contribution of residents to patient care. The "shape" of the functions and the degree of substitutability among inputs are critical to the hospital's behavioral response to demonstration or BBA incentives, as shown later. At this point, it is important simply to note that the functions are flexible enough to allow for different substitution elasticities between residents of different types and other inputs as well as different input productivity levels by case type.

[1] Note that, with positive bequests, investment income, etc., teaching hospitals can run negative operating margins. Indeed, legally they cannot run perpetually large, positive total margins as non-profit legal entities. Hence, it is reasonable to expect total margins to hover near zero over a long period.

Residents themselves, are simultaneously considered an "output" of the hospital's educational mission as well as an input to patient care. The corresponding "resident production function" can be written as:

(A-4) $R_j = r_j[MD, Q_i]$.

The j resident output functions explicitly recognize the complementary relationship between attending physicians and residents in the teaching activity. The j subscript connotes a different attending-resident ratio for residents in different specialities. (For simplification, we ignore the varying R/MD ratio depending on year of residency.) The set of resident functions also points to the key role patients (Q) play in "educating" residents. With more patients, a hospital can provide more residents with learning opportunities.[2]

Hospital revenues and costs are decomposed as

(A-5) $RV = p_m(1 + IME)Q_m + DME_m + NYGME + p_pQ_p$

(A-6) $C = \sum w_jR_j + w_nN + w_{md}MD + w_kK$

where p_m and p_p = the standardized Medicare DRG per discharge payment and the average private payment, respectively, IME = Medicare's indirect medical education adjustment add-on factor based on the number of residents per bed, DME_m = Medicare's direct medical education payments, NYGME = GME payment set-asides for Medicaid and private payers in New York, $Q_m + Q_p = Q$ = Medicare and private (and other) discharges, and the w_n, w_{md}, and w_k = the effective wage rates corresponding to the inputs to production. Medicare's IME add-on factor, expressed as

(A-7) $IME = MF[1 + IRB]^{.405}$,

where MF = the Congressionally determined multiplier factor and IRB = R/BED = the resident-to-bed ratio, raises Medicare payment amounts by a nonlinear factor dependent upon the number of residents per bed. Medicare DME payments can be decomposed as the multiplicative product

(A-8) $DME_m = deR$

[2] Resident Review Committees (RRCs) also set quotas of patients or surgical procedures to be performed before becoming board-eligible. RRCs also set minimal attending supervision requirements as well.

where $e = w_r(1+r)$, the Medicare established payment per resident, and w_r = the resident's stipend and r = the proportional add-on factor to cover faculty and other teaching costs. Medicare's share of all DME allowable costs is based on its share of all inpatient days which can be more explicitly written as an inverse function of the ratios of non-Medicare to Medicare lengths of stay and discharges: $d = 1/[1+(LOS_p / LOS_m)(Q_p / Q_m)]$, and LOS_m, LOS_p = average lengths of stay of Medicare and non-Medicare patients. In hospitals where non-Medicare lengths of stay and/or discharges are falling faster the Medicare's, d rises and Medicare covers more direct teaching costs.

Embedded in the revenue equation (A-5) are two Medicare and non-Medicare patient demand functions:

(A-9) Medicare: $Q_m = q_m[QL; Z_m]$

(A-10) Non-Medicare: $p_p = p[Q_p, QL; Z_p]$

where QL = patient perceived quality of care and Z_m, Z_p = other Medicare and non-Medicare factors affecting demand (e.g. beneficiary age distribution, depth of insurance of patients). The hospital is assumed to be a price taker for Medicare, i.e., p_m = constant, but the institution cannot treat necessarily as many Medicare patients as it would like to at the going DRG price. Quantity demanded by Medicare patients is assumed to depend, directly, upon quality competition among hospitals as well. Non-Medicare demand is assumed to have some price sensitivity, although hospitals may be price-takers for Medicaid as well.[3]

Hospital maximizing behavior can be captured by forming the Lagrangian function(L)

(A-11) $L = u[Q, R] + \lambda[RV + S - C]$

and differentiating with respect to all of the inputs and outputs. Concentrating on the resident optimizing condition alone, we differentiate (A-11) with respect to R, set the result equal to zero, and solve for the optimal number of residents.[4]

(A-12) $dL/dR = (du/dQ)(dQ/dR) + (du/dR) + \lambda[p_m Q_m(dIME/dR)$

$+ p_m(1+IME)(dQ_m/dR) + p_p(dQ_p/dR) + Q_p(dp_p/dR) + (dDME/dR) - w_r] = 0.$

[3] As Medicaid moves to managed care, hospital demand becomes more price sensitive as well.

[4] For now, we do not distinguish among resident specialties to simplify the subscripts.

(Resident effects on NY GME considered later.) Were the hospital a strict profit maximizer, it would set marginal revenue product, including all of the residents' effects on IME, output, private price, and DME, equal to the resident's average wage rate; in this case, the optimizing algorithm would be simply the bracketed term in eq. (A-12). Contrasting this solution with the utility-maximizing behavior that explicitly values training, we set the bracketed profit-maximizing and the full eq. (2-12) both equal to the constant resident wage, i.e.,

(A-13) $MRP_r[\pi\text{-max}] = w_r = MRP_r[u\text{-max}] + [u_q'q_r' + u_r']/\lambda$.

where MRP = the marginal revenue product of residents and u_q', u_r' = the (assumed positive) marginal utility of output and residents, respectively, q_r' = the marginal product of residents in producing discharges; that is, their marginal contribution to direct patent care, and λ = the (assumed positive) marginal gain in hospital utility from a $1 increase in patient revenues and bequests. The last bracketed term on the right-hand-side of (A-13) is positive, implying that residents' marginal revenue product in non-profit maximizing teaching hospitals must be less than it would be under strict profit maximization. The profit-maximizing marginal revenue product of residents is the collection of terms within the bracketed term in (A-12), excluding w_r, and represents the impact on hospital revenues of adding one more resident.[5] A lower MRP requires that residents be used more in producing discharges in non-profit teaching hospitals than would be the case under strict profit maximization. While more residents results in more discharges in production, the marginal rate of increased patient care is presumed to be declining and could be near zero. This is one sense in which teaching hospitals "overuse" residents; that is, by hiring residents beyond the point where their $MRP=w_r$.[6] "Overuse" is in quotes because teaching hospitals have a joint mission to serve the poor and educate physicians. This makes them less efficient and higher cost compared to private for-profit hospitals and puts them at a competitive disadvantage.

[5] Some hospital managers might argue that residents' revenue product is zero because they do not provide any patient care. Nevertheless, they still bring in revenues through the prices paid for patient care.

[6] The other key sense is which teaching hospitals overuse residents results from the "pass-through" Medicare payments via DME and IME.

The size of the second bracketed term in (A-13) is crucial in understanding how teaching hospitals behave. The discrepancy between profit-maximizing and utility-maximizing marginal revenue products is easily seen to be a function of the size of the marginal utilities of output and residents to the institution, as well as the marginal product of residents in generating discharges. Teaching hospitals with very strong commitments to increasing admissions and serving the community, and /or those placing high values on educating residents, such as AMCs, will exhibit lower resident contributions to production at the margin due to greater numbers, ceteris paribus.

The stationary condition for labor demand, eq. (A-12), can be solved another way by collecting terms and solving for the resident's marginal product in patient care in terms of the resident's wage:

$$\text{(A-14)}\quad q_r' = \frac{w_r - [p_m q_m(dIME/dR) + dDME/dR] - u_r'/\lambda}{[p_m(1+IME)+p_p]/2 + (u_q'/\lambda)}$$

Under strict profit maximization without revenue effects via IME and DME, $q'_n = w_r$. The non-profit teaching hospital optimizing rule further debits the resident wage for Medicare IME and DME contributions to revenues as well as the extra utility the institution derives purely from educating residents. One can think of the numerator of (A-14) as the resident's true effective wage in teaching hospitals. It is divided by average marginal revenues from output generated by residents and plus any extra marginal utility that institutions may place on output.[7]

Clearly, both the IME and DME payments encourage teaching hospitals to set resident productivity below actual wage stipends. The positive marginal effect of residents on IME and DME lowers the residents' effective wage in the numerator. Moreover, the greater the hospital's IME (or IRB) level to begin with (in the denominator), the lower the effective wage. Eq. (A-14) can further be solved for the desired absolute level of residents (R^*) in terms of all the exogenous variables:

[7] In deriving eq. (A-14), resident generated increases in discharges are assumed to be equally divided between Medicare and non-Medicare patients and that extra residents have no effect on what non-Medicare patients are willing to pay.

(A-15) $R^* = m[w_r, w_{md}, w_n, p_m, p_p, IRB, Q, Q_m/Q, MF, r, LOS_m/LOS_p, u_r', u_q']$

Embedded in this resident derived-demand function are the key parameters of the demand and production functions. Before drawing implications for the evaluation, let us focus more specifically on the possible impacts of Medicare GME payment algorithms on resident demand.

Net effective resident wage. The extraordinary incentive to expand residency slots, or quotas, is seen by constructing an effective Medicare net wage, w_r^*, for residents. This is equal to the going resident's wage, or stipend debited for marginal impact residents have on IME and DME payments, i.e., [8]

(A-16) $w_r^* = w_r - p_m q_m(dIME/dR) - dDME/dR$.

This is the true effective pecuniary cost of residents to the teaching hospital after accounting for the partial DME pass-through of direct resident salaries and faculty costs and the indirect effects of residents in generating additional Medicare DRG payments. Eq. (A-16) represents the additional net cost to the hospital of adding one FTE resident. It assumes no additional operating or faculty costs are incurred, which is a strong assumption that proved crucial in hospitals' decision to reduce residents as discussed below.

To make things concrete, assume IRB = .25, MF = 1.89 (before BBA), resident stipend = $40,000, the faculty loading factor r = 2, so that the DME payment per resident = $80,000, Medicare's share of inpatient days is 30 percent, Medicare DRG revenues = $50 million, and Beds = 500. Then, $p_m q_m(dIME/dR) = \$50 \text{ million}[.405(1.89)(1.25)^{595}/500] = \$87{,}400$, $dDME/dR = \$80{,}000(.3) = \$24{,}000$, and the effective resident wage, $w_r^* = \$40{,}000 - \$111{,}400 = -\$71{,}400$. A negative effective wage implies that teaching hospitals have tremendous financial incentives to take on new residents, essentially until their marginal product in producing discharges goes to zero! In effect, Medicare has made residents far more than a free input to hospitals at the margin,[9] ignoring the additional utility gained purely

[8] The effective net wage is based on financial factors and not any additional utility derived from educating residents.

[9] Marginal considerations are important. Historically, teaching hospitals, as measured by the number of residents, have been found to be more expensive than community hospitals. But adding another resident does not raise patient costs proportionately (or likely even as much, today, as the nonlinear IME adjustment would suggest).

from education. Again, this analysis ignores any additional operating or faculty teaching costs incurred with more residents.

New York State GME. New York State is unique in the way it has explicitly paid hospitals for GME for all non-Medicare payers. Based on the case study site visits, the state-specific formulas used for GME clearly reinforced national Medicare GME incentives. Under NYPHRM in the early 1990s, DME was paid for as a pass-through much like the federal program. IME add-ons to DRG rates, however, were modified slightly by upweighting primary care residents to 1.5 while downweighting resident specialities to .9 when constructing each hospital's IRB. Total residents were also frozen at 1990 levels. Hence, after 1990 until HCRA in 1997, a hospital adding one primary care resident saw its IRB ratio increase by +.6 residents per bed versus -.6 per bed if one specialist resident was added instead. The IRB change is not by a full resident per bed because of the 1990 constraint of total residents. (Adding a primary care resident involved debiting one specialist resident to maintain the 1990 ceiling on residents.) In any event, through 1995, New York teaching hospitals had very similar incentives to maximize the number of residents as under Medicare.[10]

When NYPHRM was abandoned in favor of a competitive payment system in 1996, state GME funding changed again. GME payments to individual hospitals are now distributed on a monthly lump sum basis based on the hospital's baseline share of GME spending in the region. The DME component of its share is capped by limiting the per resident amount to 150 percent of the regional average. IME amounts are based on weighted primary care and specialist residents as of 1995. HCRA also established a GME Reform

[10] To illustrate the reinforcing effect of New York GME on federal Medicare incentives to increase residents, let us recalculate the hospital's net effective wage in the above example. Now, all DRG revenues have an explicit IME add-on; thus, assuming non-Medicare revenues are the same proportion of Medicare revenues as the relative share of days (=70 percent/30 percent=2.33), then total revenues (TREV) = $167 million and TREV(dIME/dR) = $167 million [.00175] = $291,961. Add to this the $80,000 in Medicare plus New York State DME money, and the total offset to the resident's $40,000 stipend is $371,961, leaving a net of $331,961. (These calculations assume state IME parameters are the same as Medicare's.) When the state introduced residency weighting and froze total residents in calculating the state-specific IRB, the marginal incentive became weaker and asymmetric. For example, adding one specialist would have lowered the hospitals IRB by having to substitute a higher weighted primary care resident.

Incentive Pool that distributes 10 percent of the region's GME monies based on hospitals' relative reductions of residents in the region.

Initial Implications of the Model for the Evaluation Design. This simplified model has several implications for the evaluation design. First, and foremost, it provides a structure for understanding how New York hospitals came to invest so heavily in residents. The model also identifies the relevant areas of investigation, starting with the institution's all-important preferences for serving the community and training residents:

- The greater the weight the hospital (including its board and medical staff) places on expanding its size and/or residency slots, the more residents it will employ. Academic Medical Centers should exhibit higher-than-average IRB ratios for this reason.
- Institutions with greater bequests should either see more patients, train more residents, or both.
- The marginal product of residents' inpatient care is critical to the decision to reduce their numbers. If their contribution to discharges is very low at the margin, letting a resident go implies little sacrifice in terms of volume or replacement costs. This conclusion hinges on the parameters of the hospital's production function and how substitutable MDs, nurses, and others are for residents.
- The way in which residents get trained by faculty physicians needs to be explicated, including the dual relationship between attendings and residents. In production, the two stand as substitutes. With more residents, especially in afternoon and night shifts, fewer attending physicians are needed on site, plus residents can do many different tasks during the day without immediate faculty supervision, e.g., manage the ICU. On the other hand, expanding a residency program generally would require more faculty, e.g., opening a surgical subspecialty, for example. How the cuts in residents and shifts in attending job descriptions are carried out, if at all, are key to the evaluation.

The model also highlights the fact that teaching hospitals are paid more by Medicare and the state specifically for a clinical input that also represents an educational output, i.e., residents.

- Teaching hospitals receive IME payments based on their number of residents per bed. However, these payments (for Medicare, at least) are

only paid for discharged patients, implying an interactive role with volume.

- Not only does HCFA pay more per case in teaching hospitals, it also reimburses its share of resident salaries, loaded for faculty attending costs as well. Hence, any reduction in resident numbers will mean direct reductions in Medicare revenues. While resident stipend coverage is nearly one-for-one, the lost faculty revenues are not if faculty are not dismissed, discouraging program downsizing.

Teaching hospitals reducing resident complements thus face a triple impact: (1) revenue reductions via IME; (2) revenue reductions via DME; and (3) the likely substitution of more expensive attending physicians and other clinicians for residents in caring for patients. This raises the question of the behavioral responses under the voluntary demonstrations in New York and elsewhere versus those under the new BBA rules more generally.

A.3 The Impact of the BBA GME Rollbacks and Transition Incentive Payments

Let us now modify the model to incorporate BBA GME reductions and offsetting transition payments under HCFA's demonstration. In 1997, Congress passed the Balanced Budget Act (BBA) that included significant reductions in Medicare GME payments.[11] In order to understand the financial constraints and incentives facing teaching hospitals considering to participate or drop out of either the New York or national BBA resident reduction initiatives, consider the following model. First, total GME is the sum of IME plus DME payments. "Hold harmless" transition Medicare transition payments under the New York demonstration is a declining percentage of the payments Medicare would otherwise have made for residents that the hospital agrees to forego in accord with targeted reductions. For IME, each participating hospitals' net IME payment in any demonstration year will be

[11] Although the New York teaching hospitals had already made their decision to accept transition payments for downsizing their residency programs, their net loss of maintaining resident counts was less than expected under BBA. Hence, BBA, technically, only has a significant effect on the decision to withdraw.

a weighted average of what the hospital would have received with a fixed IRB ratio prior to the demonstration and what it would receive based on current BBA rules:

(A-17) $NMET = h_t AIME_o + (1 - h_t) AIME_t$

where NMET = net total Medicare IME payments including transition payments, h_t = the transition percentage in year t after the beginning of the program, and $AIME_o$ and $AIME_t$ = the IME adjustment factors prior to and during the demonstration, respectively. In the Phase I New York demonstration, h_t falls from 100 percent in year 1 to 25 percent in year 6 and zero thereafter. We further assume that the BBA rules passed after the start of the New York demonstration began to apply to all New York teaching hospitals as well. Thus, even New York demonstration hospitals will be subject to the reduction in the teaching hospital multiplier (= 1.89 in 1997). This means that both the baseline $AIME_o$ and $AIME_t$ will fall over the demonstration regardless of any reduction in residents. ($AIME_t$ falls both because of a reduction in MF compounded by resident reductions.)

Consider the impact on a major teaching hospital with IRB = .25 participating in the Phase I New York demonstration. Its net total NMET, including transition payments, will be:

Year 1: $NMET_1$, $= 1.0\ (1.89)\ ((1.25)^{.405} - 1) + 0.0\ (1.89)\ ((1.2375)^{.405} - 1) = 1.89\ (.095) = 0.18$

Year 2: $NMET_2$, $= .95\ (1.6)\ ((1.25)^{.405} - 1) + (1 - .95)(1.6)(1.225)^{.405} - 1)$

$= .95(0152) + .05\ (.137) = .144 + .007 = .151$

Year 6: $NMET_6$ $= .25(1.35)((1.25)^{.405} - 1) + (1 - .25)((1.35)(1.2)^{.405} - 1)$

$= .25(.128) + .75\ (.104) = .032 + 0.78 = .110$

Year 7: $IMET = 1.35[(1.2)^{.405} - 1] = .103$.

This assumes the IME multiplier falls from its original 1.89 at the beginning of the demonstration to 1.6 in 1999, the demonstration's second year, to 1.35 in 2003 and that

hospitals reduce the resident IRB 5 percent in year 1, 10 percent by year 2, and by 20 percent by year 6.

Several points about the BBA rollbacks and offsetting transition payments are important. First, hospitals who are successful in reducing residents will see substantial declines in their IME add-on factors to their DRG payments during the course of the demonstration. This is due to two factors: (1) a falling IRB due to declining residents; and (2) additional BBA reductions in the IME teaching multiplier. By year 7, any hospital with an original IRB = .25 will see roughly a 42 percent decline (.103/.18) in its IME payments from baseline if it is successful in reducing its IRB to 0.20. Nearly 30 points (1.35/1.89) comes from the reduction in the multiplier factor. The reduction in residents has much less of an effect because of the IRB's nonlinear adjustment. While hospitals with higher IRBs in the base period stand to lose more revenues, the percent reduction (42 percent) is independent of the IRB. However, during the transition period, a successful participating hospital that achieves a 20 percent reduction will receive substantial IME transition dollars.

The effects on Medicare DME involve a similar calculation. Assuming Medicare's share of days is constant, a 20 percent decline in residents means a proportional 20 percent decline in Medicare DME, unlike IME reductions which are compounded by reductions in the multiplier factor as well. The net economic impact on hospitals depends upon any difference between what Medicare was paying per resident and the hospital's true DME per resident cost.

The overall percent reduction in Medicare GME by year 7 for a hospital achieving a 20 percent reduction in their IRB = .25 can be considered a weighted average of the DME and IME percent reductions: $a \cdot 20\% + (1 - a) \cdot 42\%$, where a = the hospital's baseline share of DME payments in total GME Medicare payments. Nationally, IME payments are twice as much as DME, i.e., a = .33. At this ratio, hospitals can expect to lose slightly over one-third of their Medicare GME payments with a 20 percent reduction with residents. Compare this with a hospital that doesn't make any resident reductions. It loses only about 19 percent of its GME revenues through a 29 percent decline in IME alone.

A.4 Impact of New York State GME Payment Reductions

In addition to the legislated rollbacks in federal GME payments, New York even earlier enacted major changes in the level and methods for reimbursing GME. Three structural changes are key. First, on January 1, 1997, the state rate setting system was abandoned in favor of private insurers negotiating their own rates. For private payers in the Professional Education Pool, the new law assesses a tax to cover an estimated 54 percent of what they were previously paying for GME (100 percent of DME and 60 percent of private IME) under the rate setting system. Payers are also free to negotiate hospital rates. A smaller Reform Incentive Pool sets aside an additional 10 percent of private GME funds to pay providers who reduce their resident counts and shift more to training primary care residents. Thus, private payers will be paying considerably less for GME than under NYPHRM. A second change is in the distribution of GME payments. The state now relies on baseline GME shares of all regional GME expenditures to allocate regional GME pools. And third, on the public side, New York received a Medicaid 1115 waiver for a "Partnership Plan" that moves over 2 million Medicaid eligibles into managed care. While the state carved out of HMO premiums an amount targeted for GME payments through the regional pools, managed care providers can (a) negotiate lower hospital rates, and (b) reduce inpatient utilization. Fee-for-service payers area also free to negotiate hospital rates. Thus, it is not clear how much of the quasi-guaranteed state GME payments HMOs will allow teaching hospitals to keep. In a competitive insurance market, HMOs should negotiate deeper discounts knowing hospitals are receiving GME payments. This behavior is what is meant by the phrase, "we don't pay for medical education for our patients." So long as there is excess bed supply, much of the GME pass-throughs to hospitals should effectively keep passing through to HMOs, who, in turn, are only recovering part of their GME-reduced premiums.

Several additional implications for the hospital demand for residents follow from these changes. First, the New York changes in GME payments reinforce national BBA changes. New York hospitals cannot expect to shift their GME costs onto private payers or

Medicaid in New York. The carve-out for GME for private patients will be far lower that what it has been historically, raising the effective wage for residents (i.e., they won't be as inexpensive as before). HMOs will be free to negotiate lower payment rates and shorten stays that will further reduce the demand for residents. Second, while Medicaid has carved out an amount historically equal to previous Medicaid GME under NYPHRM that it will pay directly to providers, payments are constrained to allowable inflation and will certainly be less than what most hospitals would have received over the 1997-2003 period. Plus the GME allocation scheme based on regional pools will hit the very high cost GME hospitals harder, especially those training disproportionate numbers of specialists. The 150 percent cap on regional DME cost per resident further reduces some hospitals' GME payments.

The New York GME reforms were predicted to reduce overall GME funding from non-Medicare payers by 25 percent, which is somewhat less than the BBA rollbacks in GME on a percentage basis. However, on an absolute basis, the state reductions are larger than Medicare's -- especially for Medicaid-dependent providers. But possibly even more of a concern is deregulation allowing HMOs to negotiate lower overall payment rates and drastically curtailing inpatient utilization. It may be that residents are still a financially viable input treating patients and bringing in substantial IME add-on payments, but their real cost to the hospital has definitely risen while their productivity in patient care should fall with declining utilization.

A.5 A Theory of Voluntary Participation in the New York Resident Reduction Demonstration

The Minimum Loss Participation Decision. A model of participation in the New York resident reduction demonstration is based on the underlying hospital demand for residents adjusted for BBA changes and the level and distribution of transition payments. In deciding whether to voluntarily reduce their number of residents, hospitals are **hypothesized to have weighed the net cost of replacing residents (NCRR) against expected future net**

losses from maintaining the baseline resident count (NLNR). The hospital's decision, based on a minimum loss criterion, is

(A-18) MIN : LOSS $[E[\Sigma_t NCRR_t/(1+s)^t]$, $E[\Sigma_t^{\infty} NLNR_t]/(1+s)^t]]$.

The optimizing hospital will participate and accept transition payments if the expected net costs of reducing residents is actually less than the expected losses from not reducing residents when spread across the infinite future and discounted by s, the facility's time preference for money. The decision is dichotomous; hospitals do not have the flexibility to reduce the number of residents along a continuum. Hence, significant risk is involved in the decision, although hospitals can drop out at any point once they have re-evaluated their optimal level of residents.

Net Costs of Reducing Residents. Over the six-year demonstration period, these costs can be decomposed as

(A-19) $\Sigma_t NCRR_t = \Sigma_t NFIME_t + \Sigma_t NFDME_t + \Sigma_t NRRC_t$

where $NFIME_t$ = Net Foregone IME payments in year t, $NFDME_t$ = Net Foregone DME payments in year t, and $NRRC_t$ = Net Resident Reduction Costs. Hospitals are posited to consider reductions in their IME and DME payments resulting from fewer residents net of any transition payments. They also consider the savings from eliminating resident stipends and reducing faculty, net of the additional cost of substituting other clinical personnel in serving patients. (Maintaining volumes is a strong assumption that is relaxed later.) Let us evaluate each of the three separately. In so doing, we concentrate on Medicare BBA and demonstration incentives. Changes in New York GME incentives are discussed later.

Net foregone IME revenues can be written as

(A-20) $\Sigma_t NFIME_t = \Sigma_t MRV_t (1- h_t) MF_t [(1+IRB_o)^{.405} - (1+IRB_t)^{.405}]$

where MRV_t = expected Medicare inpatient revenues in year t before any IME add-on, and $IRB_{o,t}$ = the hospital's resident-to-bed ratio in the baseline (o) and current (t) demonstration year. The formula assumes that the hospital has met its targets and reduced its IRB sufficiently to enjoy transition payments. Net foregone IME payments depend positively on total Medicare revenues, the IME multiplier factor, and the nonlinear difference in IRB

ratios. Foregone IME is less, of course, the greater the transition percentage h_t. In year 1, transition coverage is 100 percent ($h_t = 1$), and no IME losses accrue to resident reductions. Demonstration hospitals are at risk for annual changes in their Medicare DRG revenues and BBA-mandated reductions in the IME multiplier factor. As MF is reduced, for example, regular IME payments decline, resulting in absolute IME losses before any resident reductions. These are partially offset in any demonstration year depending on h_t.[12] Although BBA-mandated reductions in the IME multiplier factor involve significant GME reductions, CFOs in participating hospitals did report taking the "lower value" of residents into consideration when deciding to participate.

Net foregone DME revenues can be written as

(A-21) Σ_t NFDME$_t$ = Σ_t (1 - h_t)(d_{mr}/d)(w_{rt}(1+r))B_o[IRB$_o$ - IRB$_t$]

where (d_{mr}/d) = Medicare's share of days, w_{rt} (1+r) = the resident's annual stipend factored up by the faculty teaching cost percentage, r, and B_o = the hospital's baseline bedsize (assumed unchanged). (For symmetry, we convert total resident counts into IRB rates multiplied by bedsize.) The hospital's net foregone DME payments depend positively on its Medicare share of days, the resident's approved stipend, the faculty loading factor, and the reduction in residents. Again, lost DME payments depend negatively on (i.e., is offset by) transition payments and by how much the IRB ratio has fallen.[13]

Net resident replacement costs can be considered as the difference between the substitution costs involved in replacing residents and the reduction in outlays on resident wages:

(A-22) Σ_t NRRC$_t$ = B_o Σ_t [IRB$_o$ - IRB$_t$](SCOST$_t$ - w_{rt})

[12] To make things concrete, a hospital with $50 million in Medicare revenues in year 2 of the demonstration (when h_2 = .95 and MF = 1.6), would forego $35,700 in IME payments if it succeeded in reducing its IRB ratio of .25 by 10 percent (to .225). This is contrasted with year 6, where h_t = .25 and MF = 1.35, and the hospital has reduced its IRB by 20 percent to meet its target (some hospitals must make 25 percent reductions). Foregone IME payments (relative to no resident reductions) would total $910,000 in year 6. In year 7, the first post-demonstration year, foregone IME payments would amount to $1,215,000. (How hospitals view these losses will be considered later.)

[13] Assuming a $40,000 stipend and a 100 percent faculty loading factor, a 10 percent reduction in residents in our previous example (=12.5 FTEs) in year 2 of the demonstration implies $15,000 in foregone DME revenues. By year 6, with only a 25 percent transition percentage, this foregone amount has risen 30-fold to $450,000. In year 7, the net DME loss is a full $600,000. Thus, hospital foregone IME is roughly double DME losses by year 7.

where $SCOST_t$ = the average expected cost of other clinical personnel replacing a resident. NRRC does not include any cost offsets that might be associated with fewer teaching faculty included in DME or any savings from more efficient patient care. These costs are considered later. It does assume unchanged hospital volumes. The cost of substitutes depends upon their skill mix, required work effort, and salaries. According to Knickman (1992), .7 non-physician practitioners (NPPs), .1 aides, and .2 attending physicians are required to substitute for one resident (derived from PPRC, 1993, p.77).[14] These rates account for the fact that residents work twice as many hours a week as non-physician personnel.[15]

Summarizing, the net costs in our example hospital would rise from $456,950 in year 2 to $2,477,500 in year 6 by reducing its resident complement by 20 percent. Payment losses from IME and DME rise from 11 percent in year 2 to 67 percent in the last year of the demonstration, due to the accelerated decline in transition payments. Personnel replacement costs are assumed to rise proportionately with the decline in residents and never are offset directly by transition payments.

Any New York hospital with an IRB >.25 potentially faces some very large net costs over the period of the demonstration in meeting its reduction targets. Besides the obvious factors that affect the net costs, such as the size and dependence of the hospital on Medicare, the analysis assumes (a) no reduction in teaching faculty costs, (b) a direct substitution of other personnel for residents that assumes a high attending physician salary, and (c) no change in volume. Case study interviews indicate that hospital managers took all three factors into account, effectively softening the financial blow of participating.

Net Loss from No Resident Reductions. In deciding to participate, the facility is further constrained to reducing residents at least 20-25 percent, thereby increasing NCRR and

[14] Case study interviews suggested wide variances in the way hospital managers view resident replacement staffing and costs, as discussed below. These differences played a key role in initial participation decisions.

[15] Assuming NPPs are paid $50,000, aides are paid $25,000, and attending physicians, $175,000, the personnel-equivalent cost of a resident is $72,500 using Knickman's formula. Plugging this value in for SCOST along with the estimated $40,000 resident stipend, gives $406,250 in additional personnel costs in year 2 from a 10 percent resident reduction (12.5 x [$72,500 - $40,000]) versus $812,500 additional costs in year 6 (and thereafter) when residents are 20 percent less.

reducing the likelihood of choosing to participate. For hospitals intending to reduce resident counts by 20-25 percent or more given the IME multiplier reduction, the decision to participate and accept transition payments seems clear. A possible caveat would be anxiety about meeting the annual reduction targets, not to mention the organizational challenges in deciding which specialties would be reduced and by how much. The remainder of hospitals fall in a gray area. They would certainly reduce residents by some amount, but would the transition payments be enough to entice some to make the mandated quotas? Adding further uncertainty to the decision is the payback requirement for failing to meet the end period 20-25 percent target reductions. Of course, not all teaching hospitals face the same Medicare losses to downsizing. Low Medicare hospitals also stand to lose less in terms of IME and DME payments. They may be expecting large Medicaid or private GME reductions, however.

Given the sizable expected up-front losses to reducing residents in terms of foregone Medicare IME and DME payments plus the costs of replacing residents, the expected losses in the future of not downsizing would have to be considerable. What are they?

First, concomitant changes in GME reimbursement are also taking place in New York. It is estimated that GME payments from private payors will fall to 54 percent of their previous levels. Hence, hospitals with private pay patients may be more vulnerable by not reducing resident complements. On the other hand, it appears that the state intends to shelter teaching hospitals from direct reductions in GME Medicaid payments while moving a few million eligibles into HMOs. This, by itself, would discourage very Medicaid-dependent hospitals from participating in the federal demonstration as they have far less to lose from IME and DME rollbacks.

But second, and what we hypothesize to be far more important, are expected declines in Medicare, Medicaid, and private patient care revenues in general. As HMOs are allowed to negotiate discounted fees and cut back on unnecessary inpatient utilization, it is reasonable to expect revenue reductions of 20 percent or more. This has the effect of drastically shifting down the resident's marginal revenue product curve. Hospitals that feel particularly

vulnerable to volume declines such as those with excessively long stays and unnecessarily intensive stays should be more inclined to participate and plan an orderly reduction in residents.

The time preference for money also plays a role. Hospitals with high time preferences will heavily discount future losses and worry more about the high short-run costs of replacing residents. These facilities should be disinclined to voluntarily reduce residents in the short-run, thereby avoiding losses in IME and DME payments and higher personnel replacement costs. Generally, high time preference hospitals would be those operating in the red; they may not be able to afford the up-front costs of cutting back.

How costly it might be to replace residents with other personnel will affect the decision, negatively. The higher the alternative wages (or effective costs) of nonphysician personnel and attending physicians, the more costly it is to replace residents and the less likely it is that the hospital will voluntarily reduce residents. Attracting more attendings in high crime, high uninsured areas will be more difficult; ergo, more costly. Similarly, the less elastic the substitution possibilities in production, possibly because of the specialty mix of residents, the less likely that it is the hospital will participate.

The other disincentive to participate is the utility that the hospital and faculty place on teaching residents. High utility implies strong resistance to reducing residencies. It is difficult to assess the utility providers place purely on educating residents. Hospitals with "weak" residency programs are hypothesized to be more willing to reduce their complements. Weak is defined in terms of unfilled slots and lack of revenue generating power, e.g., anesthesia, psychiatry, subspecialties like endocrinology. Academic Medical Centers that have strong vested interests in maintaining a sizable department should be particularly resistant to cuts. Teaching is essential to their mission.

Clearly, all of these factors affect the participation decision in an uncertain world. It is not clear at this point which factors will dominate in a particular site. Many will be positively or negatively correlated. Hospitals with thin margins likely operate in poorer high crime neighborhoods where the cost of replacement personnel would be high. Both factors

should work together to eschew participation. In contrast, they are likely to be far more dependent upon Medicaid GME revenues, which should be more protected by the state than Medicare or private payers would. Against all of these factors may be the fact that drastic cuts in Medicaid utilization are predicted from managed care, and the hospital doesn't dare risk keeping idled residents.

Appendix B

B

Results of Case Study Interviews Concerning Participation

During the first phase design period, HER sent teams of interviewers into Buffalo and New York City to conduct interviews with participating hospitals, medical school directors, and state and local experts. These interviews helped inform our evaluation in many respects including reasons for participating and subsequently considering to drop out. (HER staff did conduct one visit to a drop-out hospital in New York City. After our site visits, a few other hospitals that we visited decided to drop out as well.) Below, we have organized respondent comments regarding participation into 6 categories:

- *Volume*--including expected or actual changes in inpatient and outpatient utilization that would impact on the need for fewer residents;
- *Program*--including characterizations of the residency programs that would encourage or discourage participation;
- *Affiliations*--including changes in affiliations and rotations influencing participation;
- *Payer*--including changes in federal, state, and private coverage of GME;
- *Replacement*--including factors affecting the ease and cost of replacing residents in patient care;
- *Miscalculation*--reflecting the ways in which participants felt they had erred in deciding to participate unrelated to the above factors.

We have not made a sharp distinction between reasons for initially deciding to participate and those leading to disenrollment. Interviewees spoke often of the challenges of meeting the reduction targets even though they were still participating as of our interviews. In some cases, the challenges became overwhelming and they dropped out. We believe that stated reasons for possibly dropping out are also fair indicators of why some teaching hospitals never participated in the first place. We have not generally commented

on the veracity of the options of participants. Most of the comments reflect personally held attitudes that affect individual and group behavior regardless of their ultimate accuracy.

B.1 Volume-Related Factors

- HHC hospitals, interviewees reported, were strongly in favor of participating in the demonstration for three reasons. First and foremost, many were experiencing significant declines in inpatient volumes, resulting in closing roughly one-third of their beds over the last few years. Lower volumes necessitated fewer residents both for providing direct patient care as well as fewer patients for training purposes.

- The shift in site of care from inpatient to outpatient, coupled with new Resident Review Committee (RRC) requirements for Internal Medicine residents to spend one-third of their time seeing outpatients, is reported to have substantially decreased resident productivity. This is primarily due to the greater one-on-one oversight of residents required in outpatient care by attendings. Attendings are able to supervise patient rooms or even completely off-site.

- RRCs are reported to be more assiduous in insisting that surgical residents meet their procedure quotas in order to become board-eligible. This has had a minor effect in reducing the demand for surgical residents to make sure all residents meet their quotas.

- A complaint occasionally heard in the case study interviews with hospital managers was the heightened competition between participants and nonparticipants over admitting physicians. The demise of NYPHRM and spread in managed care in New York has placed a new premium on attracting patients. Even Medicaid managed care contracts are claimed to be quite competitive. Participating hospital managers and department chairs felt that resident reductions sometimes sent the wrong signals to admitting physicians looking for resident support.

- The threat of HMOs starting "to take volume out of the hospital" motivated a few hospitals to participate--particularly in the Buffalo area which was reported to be "grossly overbedded" due to a declining population. Low occupancy rates created an "open license" for HMOs to negotiate price discounts of 30 percent or more.

- Yet, one knowledgeable CEO in Buffalo was surprised that the managed care impact on volumes had been less than expected. Possibly the low AAPCC in the city resulted in weak entry of aggressive national Medicare HMO chains. In any event, all HMOs were in Stage 1 negotiating price discounts and not having a great effect on patient inpatient use.

- New York Medicaid capitation rates have fallen, resulting in an exodus of stringent for-profit HMOs from the market. Many of the remaining HMOs are provider-sponsored plans (e.g., Health First, Metro Plus) dominated by hospitals.

- With the advent of managed care, AMCs and other hospitals that traditionally did not serve many Medicaid patients began setting up community-based clinics (e.g., Primary Care Development Corporation) to attract Medicaid patients. It was estimated that 60 percent of primary care in New York City was now provided in these clinics and that AMCs were actively competing with HHC hospitals for publicly insured patients.

B.2 Program-Related Factor

- HHC hospitals saw the demonstration as an opportunity to scale back weak educational programs and receive transition payments.

- In some interviews, it was suggested that larger programs might be a proxy for weaker programs that could stand larger cuts. This was true for two reasons. First, these programs may have a higher percentage of IMGs with weaker educational backgrounds. Second, large surgical programs may rely more on preliminary surgery slots that are filled by residents prior to officially entering a residency program. In addition, sheer size makes it easier from a training and patient care standpoint to achieve 20-25 percent reductions.

- Certain programs were singled out in interviews as prime targets for reductions. These included the RAPs (radiologists, anesthesiologists, and pathologists) who do not treat patients and are either facing oversupply or, in the case of anesthesiologists, have very close substitutes (e.g., nurse anesthetists).

- Psychiatry residents were also viewed as being expensive while providing little direct patient care.

- All hospitals naturally eliminated or reduced their nonaccredited programs first, as well as programs where residents were having difficulties getting good jobs.
- Managers also targeted programs that were having to be filled in large degree by IMGs.
- Large pediatrics programs were also mentioned as ripe for cutbacks because of the low quality of some of the residents.
- Most medical directors mentioned the desire of downsizing or closing weak programs as a reason for participating. Some were concerned over the threat of disaccreditation of programs and saw the demonstration as a way of justifying (and paying for) reductions they wanted to make anyway but lacked financial support for implementing.
- The argument for maintaining residents to attract admitting physicians was reinforced by educators wishing to attract new, prestigious department chairs. "Who would want to come and head up the downsizing of a teaching program?" asked some teaching faculty. This might explain why some hospitals did not participate originally and why others decided to drop out.
- Hospitals in upstate New York felt that the primary care/specialist ratio requirements of the demonstration were problematic. Educators believed that the need for primary care physicians had run its course and that managed care systems were moving back to more specialist-directed care. Yet, if a hospital or consortium reduced its primary care residents, the demonstration required even greater reductions in the number of resident specialists to maintain its high primary care ratio. Upstate hospitals also argued that they had already made significant reductions in specialty-oriented residencies in the last decade. To make additional 20 percent cuts (or more if weak primary care residencies were cut at all) was very challenging.
- Program directors in Buffalo believed that the resident reduction targets would be greater in downstate because hospitals there had much larger residency programs that relied more on IMGs. It came as a surprise to many upstate that all the targets were site-specific. Directors felt that downstate hospitals should have been held to higher reduction targets.
- On the other hand, some downstate hospitals believed the demonstration was right for them given their very high proportion of specialty teaching programs.

- A few medical directors, physicians, and CEOs we interviewed truly believed that both the State of New York and the nation were oversupplied with specialists. Sometimes, their residents were having difficulties finding jobs, but the sentiment was more often that downsizing "was the right thing to do."

- Large pediatrics residency programs sometimes presented special problems because they included a number of weaker students. Any reductions in these programs, however, added to the pressure to reduce specialty residencies by a similar amount. If that proved politically impossible within the institution, the hospital was "stuck training a number of marginally qualified pediatric residents" simply because they were designated as primary care.

- Either for economic or education reasons, a few hospitals reported expanding their most expensive, visible services such as neurosurgery or heart surgery. Adding residents in these areas was necessary to attract "super-surgeons." This required even more cuts in other resident specialty programs to maintain or increase primary care resident ratios.

- In the Buffalo consortium, because of the large number of small, dispersed resident programs, the group was finding it impossible to make across-the-board program cuts. On the other hand, it was very difficult to eliminate small programs like cholerectal surgery entirely for internal reasons.

- One consortium member believed their large primary care residencies made it advantageous to participate unlike other individual members emphasizing primary care. This was because the consortium as a whole had to maintain its primary care-specialist ratio; hence, a smaller proportion of cuts were being required of primary care-oriented members.

- The Bell Commission and the limits it placed on resident work hours required one member to double the number of residents in a particular primary care program. The demonstration now offered the opportunity of be more selective in their matches and upgrade the average quality of residents.

- The principal response to Code 405 restrictions on resident patient care hours was to require attendings to take over more patient care responsibilities in most facilities. One concern of managers, however, was the incentive of hospitals to take on more residents of lower quality to spread out the work load. This behavior may partly explain the rapid increase in New York residents over the last decade--especially IMGs. Faced now with the strict enforcement of Code 405, hospitals have even

less incentive to cut residents--except where volumes have fallen significantly.

- Program directors and physicians sometimes felt that HCFA's broader definition (than New York's) of primary care made resident cuts more difficult. HCFA defines all OBGYN residents as primary care. Hence, any reductions in these residents, because it reduces the participant's primary care-specialist ratio, requires even greater cuts in specialists than if OBGYN residents were counted as specialists.

B.3 Affiliation-Related Factors

- Resident rotations greatly complicated the willingness and ability of hospitals to downsize their programs. Under both BBA and the New York demonstrations, all hospitals have incentives to reduce in-rotations and expand out-rotations. Some hospitals have eliminated one or all of their in-rotations so as to reduce the resident FTE counts. Returning residents to sending hospitals has forced the latter to drop out of the demonstration because of the necessity of cutting even more than 20-25 percent of their baseline residents.
- A few hospital CEOs and CFOs cited hospital mergers as a reason for needing fewer residents. Consolidating services did not require as much resident coverage or the need to place a minimum number of residents in each facility.
- In Buffalo, one CFO believed that the consortium kept potential drop-outs in the demonstration because their partners wanted to continue receiving the transition payments. This effect does not seem to be evident with the recent drop-out of the Mt. Sinai and NYU consortia, however.
- The demonstration reportedly destroyed the affiliation between Montefiore and Jacobi when the latter institution discovered that Montefiore was counting residents that rotated through Jacobi.
- Onerous, obtrusive demonstration reporting requirements and audits also encouraged drop-outs. Some had concerns that HCFA would find unreported residents and track down FTEs over quotas. Mergers and intersecting networks also greatly complicated the hospital's internal tracking system, resulting in surprises for the CFO when HCFA completed its audits.

B.4 Payer-Related Factors

- Several financial managers, in explaining why many hospitals have dropped out of the demonstration, noted the implicit transition payments in the BBA. These result from two time-dependent factors. First, under the BBA, a hospital's IRB is measured with a one-year lag. Thus, reductions in residents in the current year do not depress IME add-on factors to Medicare DRG payments in the current period, allowing a "slush fund" to be built up for next year. Second, the BBA uses a 3-year moving average in counting residents. Thus, reductions in residents only depress a hospital's IME and DME payments slowly over time. This provides additional implicit transition payments as noted by one respondent: "Why not take advantage of these two ways of counting residents without the onerous requirement to achieve large resident reductions or give all the payments back?" BBA, in essence, provided hospitals with a "soft landing" without the risk of participating in the demonstration.
- When one hospital failed to meet its reduction target, it dropped out of the demonstration because it had gone below the BBA resident cap. This allowed the institution to actually increase residents if it wanted to.
- Along with the implicit transition payments of BBA, New York State incentives to downsize resident programs were emphasized by hospital managers. HCRA resident reduction incentive pools, like BBA, partially paid for downsizing, again without the onerous targets of the HCFA demonstration.
- Caps on IMG residents and payments, threatened at one time both at the state and national level, encouraged IMG-dependent hospitals to enter the demonstration.
- When asked why a participating hospital was so willing be make substantial reductions in their residents given their very low dependency on Medicare revenues, the financial manager pointed out that the average resident in New York "draws in" almost $200,000 in GME revenues from all sources. Both New York Medicaid plus the state's explicit GME set-asides are very generous. However, such large financial support might be thought to add considerable rigidity to resident downsizing in low-Medicare hospitals, but the opposite may be true given drastic changes in GME set-asides taking place (or threatened) in the state recently. Managers believed that GME payments, previously buoying up the strong demand for residents, will be drastically reduced in the near future; hence, it may make little difference whether one is dependent upon Medicare GME or not.

- The impact of Medicare payment rules on DME are somewhat different from the states' rules. This has had a minor effect on incentives. Medicare has traditionally capped the rate of inflation in baseline DME costs per resident but not the level. Now, under HCRA, the state has capped the baseline DME cost per resident as well to 150 percent of the regional average. Reductions in residents reduces DME revenues for both Medicare and state payers, but hospitals with extraordinary resident loading factors for faculty and teaching costs incur a second payment reduction. In heavily Medicare-dependent hospitals, reducing one resident involves the loss of the stipend plus faculty allowance for that resident. But even if non-Medicare-dependent hospitals make no resident cuts, they still might incur substantial reductions in DME payments and be more inclined to enter the Medicare demonstration and accept offsetting transition payments.

- Interviews with participating hospital CFOs revealed that many had developed simulation models showing significant cash flow streams from accepting the transition payments. Cumulative profits over 5 years of $8-10 million were reported. Some of the forecasted benefits derived from BBA payment cuts that proved less draconian than expected when hospitals were deciding to participate in the demonstration. Nevertheless, a few CFOs have continued to review their simulation models and still believe that downsizing residents is profitable. Exactly how their models generate large demonstration profits is unclear, although HER staff have reviewed a couple with hospital financial managers. Theoretical analysis of the net GME payment change, including transition offsets, shows that overall payments are absolutely less than if hospitals had maintained their resident counts. Short-run profits seem to occur primarily from assumptions about institutional and professional cost savings from downsizing. While reductions in residents result in less DME revenues, some hospitals assumed they would also proportionately reduce faculty teaching costs in addition to savings in resident stipends. For example, in the first year, hospitals receive 100% of their base period DME payments even if they meet their 5 percent reduction target. This created a pool of savings from "automatic" reductions the hospital made in faculty costs. Over years, this figure cumulates to substantial savings.

- Larger programs should have greater flexibility in reducing faculty teaching costs due to scale economies. A program with 5 residents and one faculty member may not be able to eliminate that attending when 1 resident slot is not refilled. Existing attending contracts may also be inflexible in the short run as might faculty contracts in salaried AMCs.

- Savings could be assumed to accrue on IME payment reductions if corresponding reductions in IME-related hospital operating costs are assumed. The facility receives transition payments based on its base period number of residents (and IRB) multiplied by the falling IME multiplier factor. Hospital simulations seem to have accounted for this decline in the multiplier, resulting in declining transition IME payments regardless of reductions in residents. But it also may be the case that CFOs have assumed declines in resident-generated hospital operating costs as well, which was the original justification for including the IRB ratio in HCFA's hospital cost equation. A 20 percent residency reduction affects expected operating costs nonlinearly. For one hospital we visited, a 20 percent reduction was expected to result in a 3.7 percent reduction in operating costs as fewer tests, shorter stays, quicker operations would result. The 3.7 percent reduction is applied to all costs, not just Medicare, resulting in as much as $15 million savings each year. Combined with the DME savings on faculty costs, the total savings was believed to be more than enough to cover any staffing substitutions that may be required. Clearly, whether the hospital finance department assumed concomitant reductions in faculty costs and operating costs played a significant role in the financial viability of downsizing resident programs.
- Almost uniformly, CEOs and CFOs of hospitals that dropped out of the demonstration or were thinking of disenrolling felt that the BBA rollbacks were not as large as they had anticipated. At least one manager had expected much more than a one-third reduction in the IME multiplier factor as well as some capping of IMG numbers for payment purposes.
- One CEO characterized the federal government as the "freight train of GME." Once Medicare begins to reduce its GME payments, the private sector will follow. Besides, the federal government has been the primary source of support for GME until recently. Now, MedPAC, the Bipartisan Medicare Commission and Congress have all called for greater reductions in GME support.
- The New York Business Council, it was reported, has been lobbying hard for large cuts in New York GME funding. The immediate result was a 45 percent reduction in private GME direct funding after the sunset of NYPHRM. Now, the Council is lobbying for elimination of specific private GME set-asides.

B.5 Replacement-Related Factors

- HHC Central Office was eager to renegotiate supervisory contracts with AMCs and medical schools. The Corporation, through new contracts, required attendings to spend more time in member hospitals, not only educating residents, but taking more responsibility for patient care.
- HHC hospitals, in particular, saw the demonstration as an opportunity to become more "attending-driven" in their care. This was deemed crucial if they were going to compete in the post-rate setting world.
- A somewhat surprising "patients-for-sale" phenomenon was encountered during the site visit interviews. With the rapid decline in inpatient stays, HHC and other New York City non-academic hospitals found themselves in a sellers' market for patients vis-a-vis medical schools. This allegedly increased HHC's market power in renegotiating more stringent contracts requiring more on-site faculty supervisory hours. Thus, the lower derived demand for residents from volume declines offset to some degree the greater demand for substitute attendings. This had the competitive effect of driving down the real effective cost of additional attendings in several (but not all) safety net hospitals.
- Another unanticipated factor partially offsetting the higher cost of recruiting attendings to substitute for residents was the possibility of billing directly for physician services. At least one hospital, when asking physician practices to pick up any care previously provided by residents, pointed out that such care could be billed private and Medicare patients. This presumes that attendings are not being paid a fixed salary but are billing fee-for-service; hence, hospitals with non-salaried attendings (generally non-AMCs) may face lower effective costs in substituting attendings and be more inclined to reduce residents.
- When participants were required to have accurate FTE counts of their residents, some managers found some residents were being counted as working when they were on vacation; hence, no substitutions were needed.
- In the past, strong incentives existed to expand hospital Internal Medicine programs, one CFO acknowledged, in part, because they are most flexible in providing night call on the adult, pediatric, and ER services. Consequently, many internists were "reading newspapers" in the afternoon and not being used efficiently.
- Faculty at one drop-out hospital were used to working with residents and definitely do not like taking first call, which is what they would have to

do with fewer residents. Thus, high real costs of substituting attendings at night led to a dropout.

B.6 Miscalculation and Uncertainty Factors

- One spillover of HCFA's decision to base resident counts not on programs but on FTEs, has been discoveries of double-counting of residents. Some hospitals accepting in-rotations have found that sending hospitals continued to count out-rotation time in their FTE count. This created tension and, in some cases, discontinuation of affiliations.
- A major confusion was reported by several hospitals regarding the distinction between the size of medical resident programs and FTE counts. Most department chairs tended to ignore in-rotations, concentrating, instead, on their own trainees. When in-rotations were included in the hospital's FTE count by HCFA, the result was a greater total number of residents that had to be cut. Hospital GME managers were generally agreed that they should be held accountable only for downsizing their own programs and not for the partial training of outside residents. Nevertheless, some managers understood why HCFA emphasized FTE counts so as not to encourage "resident shuffling" across institutions.
- When Medicare's Fiscal Intermediary came to audit one hospital's FTEs, the CFO provided it with its resident contracts. The FI asked for the CFO's IRIS data on resident FTEs instead. By focusing on program rather than FTE counts, the hospital missed its first year target.
- All hospital managers we talked to mentioned the very short time they had in which to make a participation decision. While some admitted they did have a clear understanding of the terms and conditions of participation (including the 20-25 percent targets), they were only able to agree, internally, upon a few general downsizing principles. Later, these proved very difficult to implement, resulting in increasing strains on resident programs and eventual dropouts.
- Also emphasized was the absence of any explicit penalty for initially participating while trying to work out the downsizing details. Several CFOs did not want to take any transition payments or they put them in escrow in order to avoid "spending the savings before the hard work of achieving the entire target reductions was finished."

- Practically all hospital and program managers we interviewed believed that the first two years of cuts were relatively easy "low hanging fruit." Cuts after year 2 (and more than 10 percent) would be far more difficult.

Appendix C

C

Econometric Modeling Techniques

C.1 Panel Model Estimation Procedures

The statistical properties of several common techniques for estimating time-series cross-section regressions will be explored, including, but not restricted to, the constant coefficients model, the fixed-effects (least squares dummy variable) model, the random-effects (variance- or error- components) model, and the random coefficients model. We expect, however, that the final model will be a fixed- or random-effects model. The reason the resident charge that equation usually cannot be estimated directly using ordinary least squares (OLS) is because hospitals are heterogeneous in ways that are not always known to us. In other words, after controlling for observable hospital and market characteristics, there may still be latent unobserved factors accounting for levels and trends in the dependent variable (e.g., FTE residents). In pooled time-series cross-section estimation, variation in these "unknown" factors may result in heterogeneity bias.

The basic panel models are shown in the accompanying box. Equation X-1 is the constant coefficients model and is, as noted above, susceptible to heterogeneity bias. Heterogeneity bias is a result of the violation of the typical assumption that relationship between an outcome variable and its determinants is identical for all individuals at all time.

Basic Panel Models

1. Both intercept and slope coefficients constant over individuals, i, and time, t:

$$y_{it} = \alpha^* + \sum_{k=1}^{K} \beta_k x_{kit} + u_{it} \qquad \text{(X-1)}$$

2. Slope coefficients are constant, and the intercept varies over individuals:

$$y_{it} = \alpha_i^* + \sum_{k=1}^{K} \beta_k x_{kit} + u_{it} \qquad \text{(X-2)}$$

3. Slope coefficients are constant, and the intercept varies over individuals and time:

$$y_{it} = \alpha_{it}^* + \sum_{k=1}^{K} \beta_k x_{kit} + u_{it} \qquad \text{(X-3)}$$

4. All coefficients vary over individuals:

$$y_{it} = \alpha_i^* + \sum_{k=1}^{K} \beta_{ki} x_{kit} + u_{it} \qquad \text{(X-4)}$$

5. All coefficients vary over time and individuals:

$$y_{it} = \alpha_{it}^* + \sum_{k=1}^{K} \beta_{ki} x_{kit} + u_{it} \qquad \text{(X-5)}$$

The "one-way" model (Equation X-2) and the "two-way" model (Equation X-3) are the most commonly estimated models and both can be estimated by either the fixed-effects technique or the random- effects technique. Equations X-4 and X-5 are random coefficients models.

We've already noted the potential heterogeneity problem with the constant coefficients model – other problems are noted in Exhibit 2. The random coefficients model is often employed in macro-economic models where economic agents can change their basic behavior in reaction to changes in fiscal or monetary policy. The change in the production function does not serve to offset government policy, but it could be argued that it changed in reaction to government policy and, hence, is a reason to use the random coefficients model.

While we certainly plan to further examine the applicability of random coefficients models, we expect that our two-way (cross-section, time-series) model will ultimately be the chosen model. As noted above, a two-way model can be estimated by fixed or random effects. The fixed-effects technique is one method used to avoid or reduce heterogeneity bias by controlling completely for time-invariant differences among the individual hospitals. The fixed-effects model relies, essentially, on creating a separate dummy variable for each hospital in the sample. Fixed effects, thus, control for unmeasured hospital-specific characteristics. A problem with the fixed-effects model is that it assumes that the relationship between the dependent variable with the explanatory variables is the same for all cross sections and time periods. More specifically, it assumes the same dynamic change in residents over time once unobserved "level" differences in residents are "fixed."

The random-effects model is often touted as superior to the fixed-effects model on conceptual grounds. It differs from the fixed-effects model in that instead of assigning all of the unknown hospital-specific factors to a dummy variable for each hospital, they are assigned to a single random variable and, thus, are contained in the equation's error term. The equation's error term is then decomposed into variance or error components. The random-effects technique, thus, does not rely on an *a priori* assignment of the effects of

unobserved variables into a single variable. It is in this sense that the random-effects technique is considered "superior" to the fixed-effects technique.

The random-effects model, however, has its own drawbacks. The choice between fixed and random effects models can be driven by criteria that are not necessarily mutually exclusive. First, if the study is mainly concerned with the time-series effects, then a fixed-effects model should be used. If the study is concerned with the cross-sectional effects as well as the time-series effects, then a random-effects model should be used. Second, the use of the inferences from the model decides whether fixed or random effects should be used (Hsiao, 1986). Hsiao states, "When inferences are going to be confined to the effects in the model, the effects are more appropriately considered fixed. When inferences will be made about a population of effects from which those in the data are considered to be a random sample, then the effects should be considered random." Third, let the data decide which is the most applicable model. Data problems or a Hausman specification test can be used to select between fixed and random effects models.

The first criterion suggests that we should estimate a random effects model since we not only want to ascertain whether the demonstrations are successful (i.e., the number of residents are reduced over time), but also the types of hospitals most likely to succeed. The second criterion suggests, for the NY GME demonstration, that a fixed-effects model be estimated while, for the BBA demonstration, that a random-effects model be estimated. These *a priori* considerations, however, may have to be put aside due to data problems. The data, however, can not be examined until the evaluation phase.

C.2 Estimating the Participation Model

C.2.1 Uncertainty & "Random Participation"

Everyone HER staff interviewed was surprised by the large number of teaching hospitals that decided to participate in the demonstration. Much was made of the very short time span of one month in which to make a decision, which by itself might suggest fewer, rather than more participants. Great uncertainty over many key factors, coupled with the lack

of any penalty for withdrawing at any time before accepting transition payments, are hypothesized to have engendered a broad initial enrollment--and helps explain the large number of disenrollees, as we shall see. Hospital and resident program managers voiced uncertainty about all of the following:

- Demonstration Terms & Conditions
- Size of the BBA GME cuts;
- Continuation of New York GME funding;
- HMO price discounting & utilization reductions;
- Costs of replacing residents in patient care;
- Extent of weak training programs;
- Ability to maintain/increase primary care ratios;
- Ability to cut DME faculty costs;
- Ability to reduce hospital patient care costs;
- Actual resident counts, adjusting for in/out-rotations;
- Impact of residents in attracting admitting physicians;
- Relative importance of resident training v. hospital finances.

Clearly, nonparticipants reacted to the same list of uncertain futures in a different way than participants. Because no nonparticipants have been interviewed as yet, we cannot say which factors dominated their decision. However, the very high level of uncertainty likely introduced a large random component to the participation decision. One by-product of "random participation" is that any model explaining participation will not be very powerful in separating participants from nonparticipants. In retrospect, many participants came to the conclusion they had made a mistake in participating and subsequently withdrew. Conversely, we have no information about nonparticipants who felt in retrospect that they should have participated, given the prohibition on "late applications." However, the fact that only the Rochester consortium entered later in Phase II (then quickly withdrew) implies that few nonparticipants are now regretting their decision.

Uncertainty in several dimensions appeared to encourage participation. Not knowing how large the BBA GME payment reductions would be, or how vigorous HMO price and utilization reductions would be, or exactly how far the New York legislature might go in reducing GME payments, would all seem to have increased participation. Proof of this comes from the most often mentioned reasons for dropping out of the demonstration because of better information.

Factors that may have led to nonparticipation include the cost of replacing residents, the ability to cut faculty and hospital costs with lower DME and IME payments, and the feedback effect of residents on recruiting admitting physicians.

Uncertainty over the true size and ability to cut and reconfigure residency programs likely went both ways. Participants more likely thought that they had weak programs that should sustain major cuts. Some also felt they could or should maintain their primary care ratios while nonparticipants doubted their ability to achieve proportionate cuts in both specialist and primary care residencies. Uncertain over exactly how many FTE residents they had, and how this count was affected by changing affiliations, some hospitals decided to participate anyway while others did not.

Finally, just how important medical education was in hospitals versus hospital solvency was never directly tested prior to this demonstration or HCRA. For the first time, incentives to cut versus increase programs have gone in the opposite direction. Heretofore, more residents enhanced program prestige, money, and power while simultaneously increasing hospital revenues and profitability. Great uncertainty naturally surrounded the weight each institution placed on education versus financial status.

C.2.2 Estimation Method

Model (1) specified in Chapter 4 would be estimated using logit regression on all teaching hospitals in New York. It would be a simple cross-section with roughly 105 observations. Explanatory variables would be measured over a 3-5 year period prior to initial application for participation through the second year of the demonstration. Change in

inpatient days, for example, might be measured either over the 1995-1999 period or over a more recent period such as 1997-1999.

Model (2) would be estimated using an ordered probit model (Greene, 1997, p. 926). The ordinal probit model explicitly accounts for the systematic ordering of responses in the following way:

$y = 0$ if $y^* >= q$

$y = 1$ if $q > y^* >= m$

$y = 2$ if $m > y^*$.

Participation is treated as a form of censoring where, in the case of the demonstration, the unobserved y^* represents the hospital's desired change in the number of residents based on actual and expected changes in the hospital's environment. We do not know the desired change, however, all we know is whether the hospital decided to participate or not and how tenuous was their participation. Our expectation is that the inclination and duration of participation depends systematically on the desired change in residents. For non-participants (=0), we hypothesize that their desired change in residents is above the threshold, q, which is hypothesized to be negative. For example, non-participants, as a group, may wish reduce their resident counts by no more than q = -5%. Short-term participants may find that they wish to reduce residents by 5-19 percent, while permanent participants seek reductions of 20 percent or more.

With only 3 categories, the ordered probit estimates only one threshold, m, that effectively distinguishes the two participation groups in terms in of the marginal probability of participating short- versus long-term. A single set of probit coefficients are estimated for the model. Marginal probability effects of each variable are then adjusted by m depending on which of the three participation regimes the hospital falls into.

In subsequent evaluation models explaining actual changes in residents, the ordered probit (or the single logit from Model 1) would be used to predict each teaching hospital's likely participation status. These predicted values purge the participation variable of any selection bias.

Appendix D

D

GME Background Information

D.1 Brief History of Medicare GME Policy

Since its passage in 1965, Medicare has been the single largest funding source for GME. At that time Congress acknowledged the need to finance resident training, stating that a part of the net cost of training "should be borne to an appropriate extent by the hospital insurance program" (Association of American Medical Colleges, 1999). Behind this support was the implicit agreement that residents would be serving a high proportion of Medicare patients, thus making Medicare an appropriate funding source.

From this period until the 1980s, Medicare funded the majority of GME through Direct Medical Education (DME or DGME) payments, which reimbursed hospitals for the direct costs of residency programs including resident and faculty salaries. These payments, which were based on each hospital's historical Medicare allowable costs, created an open-ended source of finance that allowed hospitals to significantly expand their residency programs.

In addition to providing DME payments during this period, the federal government made efforts to increase physician supply in order to address anticipated physician shortages. Researchers projected that the passage of Medicare and Medicaid would lead to increasing demand for health care services (Pew Health Professions Commission, 1998). In order to address this increase in demand, the federal government provided subsidies to medical schools to increase class size and thus encourage a greater supply of physicians (Congressional Budget Office, 1995). At the same time the federal government began to encourage immigration of physicians from foreign medical schools to help meet increased service demand. Together these interventions were largely successful, as medical school classes doubled over the next two decades (Council on Graduate Medical Education, 1996).

Along with this program growth came dramatic increases in the size and cost of GME programs across the county.

Medicare continued to be the primary funding source for GME throughout the 1960s and 1970s with no substantial changes to policy. The first significant policy change came in 1983 with the implementation of the Indirect Medical Education (IME) payments as part of a new Medicare Prospective Payment System (PPS) for in-patient hospital care. Prior to this legislation, researchers reported that teaching hospitals often had higher operating costs than non-teaching hospitals due to inexperience of residents and high percentages of intensive and uncompensated care costs. In particular, researchers reported that increases in the Intern and Resident to Bed Ratio (IRB) were associated with increases in hospital operating costs (AAMC 1999).

In response to these concerns, Congress instituted IME payments in 1982 as part of the Tax Equity and Fiscal Responsibility Act (TEFRA) of 1982. Based on the IRB ratio, these payments were designed to serve as a proxy for factors that increase costs in teaching hospitals. Initially, IME payments consisted of a differential based on the IRB added to the Medicare cost limits under TEFRA. Later that year, with the implementation of the PPS system, the IRB adjustment was converted to a PPS payment called the IME adjustment, equal to a hospital's total Medicare DRG payments for inpatient services multiplied by an IRB factor. After revisions in 1986 and 1987, this adjustment factor was set at 7.7 percent for each 10% increase in the IRB. From that point on IME became an increasingly important funding source for GME, adding to the dramatic growth in GME expenditures and residency programs throughout the remainder of the decade and into the 1990s.

The next significant GME reform came in with the passage of COBRA 1985, which altered the Medicare DME payment methodology by uncoupling the relationship between direct costs and DME payments. Under this reform, each hospital was paid a portion of its per resident amount based on the DME costs incurred by the hospital during a base year period and divided by the number of residents counted in the base year. The program also audited each hospital's reported costs to determine the per resident amount. At this time the

Medicare program also limited the number of years for which it fully supports its share of residency training (AAMC 1999).

The federal government responded to concerns regarding the dramatic growth in residency programs and GME expenditures by forming the Council on Graduate Medical Education (COGME). This 17-member group was authorized to assess physician workforce trends and to recommend appropriate federal and private sector efforts to address workforce and other medical system needs. COGME serves in an advisory capacity to the secretary of DHHS, Senate committees on Labor and Human resources, and the House of Representatives Committee on Commerce. In its seventh report, COGME made the following conclusions about GME financing:

- Despite growing surpluses, Medicare pays hospitals up to 70 thousand dollar resident/year for USMG and IMGs regardless of market need;
- Despite growing federal budget problems, GME policy provides incentives for teaching hospitals to increase supply of residents, thus increasing Medicare outlays;
- Too much emphasis on hospital-based settings, with IME and DME payments based on numbers of residents in hospital settings. Creates disincentives to train residents in non-hospital settings.

D.2 National Resident Program Growth and Medicare GME Expenditures

The establishment of COGME drew attention to mounting evidence of residency program and Medicare GME expenditure growth. The Medicare GME funding system created incentives to expand GME programs beyond workforce needs. In particular, Medicare GME payments provided a substantial per resident subsidy that could influence hospitals to hire additional residents to deliver services, regardless of their potential market need. Researchers (cited below) have supported these claims by citing the steep recent growth in both residency programs and GME expenditures, especially through the late 1980s and early 1990s.

As Medicare support for GME increased over the last 30 years, the number of physicians and residents has risen dramatically. Between 1965 and 1992 the physician to population ratio increased by 65 percent, rising from 115 to 190 physicians per 100 thousand people in the population (Pew, 1998). During this same period, the number of generalists increased modestly by 13 percent, from 59 to 67 per 100 thousand people (PEW, 1998). Most of the growth, however, occurred within medical specialties. The specialist physician to population ratio increased by 121 percent over this period, from 56 to 123 specialists per 100 thousand people (Pew, 1998).

Residency programs grew steadily during the 1960s and 1970s but began to increase sharply in the late 1980s. Growth was especially steep between academic years 1988/89 and 1993/94; according to AAMC figures, the number of allopathic residents in the US grew from 83 thousand to 102 thousand over this period, an increase of 19 percent (COGME, 1998). Along with the steep growth in residents in the 1980s came a dramatic change in the composition of residency programs. While the output of United States Medical schools stabilized in the late 1980s and early 1990s, the number of residents continued to grow, primarily due to a large influx of International Medical Graduates (also known as FMGs or IMGs). Between 1988 and 1993 the number IMGs grew from 14% of total residents in the US to 23%, explaining 60% of overall growth in allopathic resident positions (CBO, 1995). The number of IMG residents more than doubled over this period, rising from 11 to 24 thousand nationwide (COGME, 1998). Presently, IMGs comprise 25 percent of all US residents (Pew, 1998).

Between 1993/94 and the 1995/96 academic years, resident numbers leveled off, as total residents increased by only 2.3 percent. However growth continued to proceed at different rates for USMGs versus IMGs. While the number of USMG residents actually decreased by 1 percent over this period, the number of IMGs increased by 11 percent, demonstrating that IMGs are largely driving recent growth in residency programs (COGME, 1998).

Accompanying the dramatic increase in residents over the last 30 years has been a steady increase in Medicare expenditures associated with GME. Between federal fiscal years 1988 and 1992 total Medicare GME expenditures increased from 3.3 to 5.2 billion dollars, an increase of 57 percent (COGME, October, 1992). While DME payments grew by only 300 million dollars over this period, IME payments rose by 1.58 billion dollars, largely driving expenditure growth. Expenditures continued to grow through fiscal year 1997, as total Medicare GME payments rose an additional 24 percent to 6.8 billion dollars. Within this aggregate, DME rose by 27% to 2.2 billion while IME rose by 22 percent to 4.6 billion dollars (Pew 1998).

As GME expenditures have increased, teaching hospitals have grown more dependent on GME as a source of revenue. For example, among Academic Health Centers in 1994, DME and IME comprised 31 percent of Medicare payments and 9 percent of total patient revenue (PEW, 1998). Increasing pressures from the health care market also served to increase hospital dependence on Medicare GME payments. In particular, the growth of managed care has exerted a significant financial impact on teaching hospitals. As managed care systems help to lower hospital reimbursement, hospitals receive less money to cross-subsidize uncompensated care and other programs (Pew, 1998). In this competitive climate teaching hospitals have increasingly relied on residents for service delivery, further fueling the rapid growth in these programs.

D.3 Current Medicare GME Policies

Amid concerns regarding the rapid growth of Medicare expenditures, the Balanced Budget Act targeted graduate medical education for significant funding reductions. While Medicare comprises 13 percent of the national budget, it sustains approximately 57 percent of the budget reductions under the BBA. Two thirds of these reductions are achieved through reducing payments to physicians and hospitals under the fee-for-service program, most notably through dramatic changes to the Graduate Medical Education funding. The reforms respond to criticisms that the GME financing mechanism created financial incentives

for states to train larger numbers of residents than necessary in order to maximize GME funding. In addition to budgetary concerns, the legislation also addresses the need to more accurately align the number of residents with workforce requirements. Growth in residency programs resulted in a noted oversupply of specialists and a shortage of primary care practitioners (COGME, 1992). The BBA attempts to address these problems by reducing and capping the number of residents trained nationwide, while encouraging a shift toward primary care specialties. The BBA changes GME funding through:

- Capping the number of Medicare funded residency positions at the 1996 level;
- Using a 3-year rolling average to determine the number of Medicare funded positions;
- Providing transitional financial assistance to teaching hospitals that voluntarily downsize residency programs;
- Providing direct reimbursement of non-hospital sites for DME expenditures;
- Reducing the IME adjustment percentage from 7.7% to 5.5% of Medicare payments over a 4-year period;
- Establishing a GME consortia demonstration project to evaluate effectiveness of financing GME through consortia;
- Decoupling GME payments from payments to HMOs for patient care (i.e. carves out GME payments from the AAPCC).

This legislation creates the most sweeping reforms to GME financing since the inception of Medicare.

D.4 Brief History of New York State GME Policy

Graduate Medical Education funding in New York State largely developed on a parallel course with federal policies. However, the state also implemented several innovative reforms to their GME system since the 1980s that helped lay the groundwork for the Medicare GME demonstration.

The State of New York has long occupied a prominent position within the Medicare GME program. Its hospitals train an average of 15,000 residents annually, representing

approximately 15 percent of the nation's resident physicians and 20 percent of Medicare's annual payments for graduate medical education. New York also has the largest proportion of teaching hospitals in the country, with 105 of the 230 licensed acute care hospitals participating in teaching programs. To support GME programs, New York teaching hospitals receive up to 190 thousand dollars per resident per year, with reimbursement of up to 80 thousand per trainee derived from Medicare sources alone. This funding system combined federal dollars with several state GME programs that have also been the target of recent reforms.

NYPHRM and New York's Traditional GME Program. The state's long- standing all-payer rate-setting system generously supported residency programs through predetermined payments, allocating larger payments for this purpose than any other state. The New York Prospective Hospital Reimbursement Methodology (known henceforth as NYPHRM) was an all-payer case-based payment methodology developed in 1982 to restructure the state hospital financing system. It approached this goal by setting consistent inpatient hospital reimbursement rates for Medicaid, Medicare, and Blue Cross, including methods of establishing equitable payments from all payors. In 1985 this system was extended to all non-Medicare payors. In 1988 the state adopted a federally inspired DRG system for financing general hospital inpatient services provided to non-Medicare beneficiaries. The NYPHRM statute underwent five separate revisions before its sunset in 1995.

The NYPHRM system added considerable support to New York's burgeoning Graduate Medical Education program, providing explicit DME and IME payments from non-Medicare insurers to teaching hospitals. DME payments were based on costs claimed in 1981 trended forward for inflation, costs of regulatory compliance, and other adjustments. IME payments from non-Medicare payers were based on each hospital's own costs and partly on the average costs of similar hospitals' total reimbursable costs, called the group rate. IME costs were carved out of a hospital's total reimbursable costs using the IRB ratio and formula before total costs were averaged into the group costs. The IME costs were then added back

to the group component rate (New York State Council on Graduate Medical Education 1992).

Recent State GME Reform Efforts. In 1987, following the lead of the federal government, Governor Cuomo formed the New York State Council on Graduate Medical Education (NYSCOGME). Comprised of 29 members appointed by the Governor, this group still serves in an advisory capacity to the governor and legislature. The Council began meeting in November 1987. Among its responsibilities the council was charged to consider

- The relationship of teaching hospitals to medical schools;
- Graduate medical education programs including the composition, supply and distribution of residency programs, subspecialty programs and fellowship training;
- Efforts to increase the number of minority physicians in training in NY and physicians in training who will serve subsequently in underserved areas in state;
- The number and specialties of physicians needed in the state;
- Policies and programs to increase the training of primary care physicians and the training of physicians in non hospital settings;
- Promotion of high quality residency training programs.

Early on the commission identified several priority areas for exploration and discussion.

- Primary Care training and practice;
- Minority participation in GME;
- Development of GME Consortia to foster relationships among medical schools, affiliate hospitals and other teaching sites. (Buffalo was original demonstration site for consortium);
- Training in geriatric and chronic care;
- AIDS and GME.

Following the formation of NYSCOGME the state instituted reforms in both payment and organization of GME that served to dramatically alter the programs in the state.

In 1992 the state responded to a noted overabundance of specialists and shortage of primary care physicians by implementing a new incentive program to encourage a balance among primary care physicians and specialists. Under this system, state IME payments for primary care residents were weighted at 1.5 while specialists were weighted at .9. These weights are then incorporated into each hospital's "added back" IRB ratio, resulting in the redistribution of state IME funding. The number of residents used to calculate the IRB ratio was frozen at 1990 levels. This program has resulted in significant changes in residency programs over the last five years in the state (NYSCOGME, 1992).

Shortly after NYSCOGME convened, it recommended testing GME consortia as a means to consolidate and streamline GME programs. Following recommendations of national COGME, the New York State Council defined consortia as a "structured formal relationship among institutions designed to meet specific goals and objectives (NYSCOGME, 1992). These objectives included monitoring and evaluating the quality of residency programs, establishing plans to improve continuity between medical school and GME, and establishing policies for recruitment, evaluation and advancement of faculty residents and fellows (NYSCOGME, 1992). The first consortium demonstration took place in Buffalo and remains in place today as a member of the current Medicare demonstration.

Among the most influential reforms of the 1980s was the passage of "Code 405" regulations in 1989. These regulations grew out of recommendations from the 1987 New York State Ad Hoc Advisory Committee on Emergency Services, otherwise known as the Bell Commission. Following the group's recommendations to limit resident working hours, the state amended section 405 of the New York State Health Code to require a sufficient number of attending physicians available to provide continuous supervision of residents. The legislation also limited resident work hours to an average week of 80 hours or less, with a maximum of 24 consecutive work hours and at least one 24-hour period off per week minimum. Finally, it required 8 hours of non-work time between scheduled on-duty assignments.

D.5 Resident Program Growth in New York State

Reflecting federal trends in GME programs and expenditures during the late 1980s and early 1990s, residency programs and expenditures in New York State grew rapidly during this period. According to AMA figures the number of allopathic residents increased from 11,949 in 1988 to 14,258 in 1993, an increase of 16 percent. Meanwhile the number of IMGs grew from 4,016 to 6,482, an increase of 38 percent. Over this same period, IMGs grew from 33.6 to 45 percent of total residents in the state. Between 1994 and 1997, the growth in residency programs slowed, as their numbers rose from 14,478 to 14,841, a percentage change of only 2.5%. However, the number of IMGs grew faster over this period, rising from 6,693 to 7,615, an increase of 11 percent. (Center For Health Workforce Studies, 1998).

D.6 New York State The Health Care Reform Act

Although the NYPHRM payment methodology proved to be an effective cost containment tool for hospitals and the state, changes in health the care environment in the 1990s led to the belief that it had outgrown its usefulness. By 1996, New York remained 1 of only 2 states with such a rate setting methodology. With the authorizing legislation due to expire on June 30, 1996, the state legislature and the Governor passed HCRA, which reformed hospital rate setting and graduate medical education among other programs. Under this system implemented on January 1, 1997, most third party payors other than Medicaid and certain state governmental agencies were authorized to negotiate payment rates with hospitals. On the same date, the state implemented wide-ranging reforms to its funding for GME programs. The legislation included a provision for financing public goods, such as a pool to finance uncompensated care, an insurance expansion for uninsured children, graduate medical education, and primary care development. The critical component of the GME reform was uncoupling of funding for the next 3 years from the total numbers of graduate medical residents. According to this system, each teaching hospital will receive a monthly payment from the applicable regional pool based on its adjusted share of a region's

total adjusted GME spending. Ninety percent of GME pool funds are distributed to hospitals based on a GME proxy driven by a hospital's historical DME and IME costs and resident counts including:

- Medicare approved DME payments per resident in FFY 1995, limited to 150% of the regional average per resident cost;
- The number of primary care programs meeting state criteria, "up weighted" to 1.5 and subspecialty programs are "down weighted" to .9 in distributing IME payments;
- Inpatient costs as a percentage of total costs in 1995;
- Inpatient third-party payer days (not including Medicare, Medicaid, Workers compensation/No-Fault, and self-pay) as a percentage of total days.

The state tied the funding to baseline resident costs and counts to remove the incentive to increase residents and maximize reimbursement levels. According to this system, New York GME funds from non-Medicare payers was projected to total 1.385 billion dollars per year between 1997 and 1999, a figure approximately 75 percent of the previous estimates of 1.85 billion per year. The funding for GME reform came from two programs initiated in 1997:

- *The Professional Education Pool:* An assessment on third-party payers is based on 100 percent of a region's 1996 DME costs plus 59.5% of IME costs after adjusting for Medicare, Medicaid, Workers Compensation/No-Fault, and self-pay uninsured levels. The intent is to ensure that third party contributions are leveled across regions at approximately 54% of current third party GME spending. Third-party payers may pay directly to pools with payments based on covered lives of families and individuals covered by insurer or self-insured plans; or payers may choose to pay on an encounter basis with a regionally determined equivalent assessment on inpatient costs plus a 24% differential. The PEP is funded at a level of 544 million dollars per year, between 1997 and 1999, with any excess directed toward uncompensated care and other purposes.
- *Medicaid GME Carve-Out-* Medicaid hospital inpatient rates include the costs associated with DME and IME based on historical costs at each facility, trended forward to the current rate setting year for inflation as

determined by a panel of economic advisers. GME funds are then paid directly to teaching hospitals per managed care discharge.

GME Reform Incentive Pool: In order to reward teaching hospitals and GME consortia for reforming residency programs, the state set aside 54 million dollars annually from the Professional Education Pool to establish a GME Reform Incentive Pool. Distribution of funds is based on achieving specific state health workforce and policy goals. Funding varies by region, with 1997 allotments ranging from 190 thousand dollars in the Utica Watertown region, to 37 million dollars in the New York City region. The program has a number of specific workforce goals to be accomplished during a five-year period:

- Reducing total number of residents and training programs;
- Increasing the number of primary care residents;
- Improving quality of training programs;
- Increasing the number of under represented minorities in training programs.

During second and third year of program three additional goals will be added including

- Increasing number of residents training in ambulatory care sites;
- Increasing the number of graduates practicing in underserved areas;
- Increasing the number of graduates from primary care residency programs who remain to practice in the state.

D.7 New York State Partnership Plan and Managed Care

In addition to pressure from the Health Care Reform Act to change the funding mechanism for GME, the accelerating expansion of managed care programs in the public and private sector also exerted pressure on GME funding. As the share of patients enrolled in Medicaid and Medicare managed care plans steadily increased in the early 1990s, hospitals faced losses in GME funding as GME payments to managed care organizations were not often reflected in the negotiated per diem rates. The decrease in inpatient days associated

with managed care also served to decrease the amount of funds paid through the per diem system for GME. Adding to these complications, the state is in the process of implementing a statewide 1115 waiver entitled 'The Partnership Plan. Approved in 1997, this waiver will eventually move 2.4 million Medicaid recipients into care plans, including 370 thousand citizens not currently enrolled in Medicaid.

Appendix E

E

Assessment of Demonstration Data and Secondary Data Sources

The purpose of this appendix is to summarize the data that will be used to evaluate the New York (NY) Graduate Medical Education (GME) Demonstration and the GME-related provisions of the 1997 Balance Budget Act (BBA). Several sources of medical resident-level data are described and assessed in Section E.1. Hospital-level cost report data sources are described and assessed in Section E.2. Section E.3 summarizes the required AHA data and their limitations. Hospital claims data needed primarily to evaluate access and quality are described in Section E.4.

E.1 GME Resident Data

The primary purpose of the New York (NY) Graduate Medical Education (GME) demonstration and the voluntary demonstration provided for in the 1997 Balanced Budget Act (BBA) is to reduce the number of residents in U.S. hospitals. To ascertain the success of the demonstrations, accurate counts of residents in hospitals participating in the demonstration and in non-participating hospitals are both needed. The three primary sources of GME data are HCFA, the American Medical Association (AMA), and the Association of American Medical Colleges (AAMC). Between them, data on individual residents and on individual residency programs can be obtained from these sources. The primary source of resident-level information will be obtained from HCFA because it has superior detail and because hospitals are required to report the data whereas the AMA and AAMC data are reported on a voluntary basis.

HCFA IRIS Data. HCFA requires hospitals that seek GME reimbursement from Medicare to submit, along with the annual Medicare Cost Report (MCR), data in an electronic format, on individual residents for HCFA's *Intern and Resident Information*

System (IRIS). To hospitals with residents, HCFA sends "IRIS software" in order to maintain consistency in the reporting of residency data. Two types of records are maintained by the IRIS software system: a master record for each resident and a record for each of the resident's rotations at the hospital. These files are then submitted to the local fiscal intermediary who, in turn, submits then to HCFA's central office.

New York GME Demonstration Data. Hospitals participating in the NY GME demonstration submit resident data to Empire Medicare Services in either Lotus® or Excel® spreadsheets. At the top of each spreadsheet, the hospital's name, Medicare provider number and the reporting period are listed. The reporting period corresponds to the "demonstration year" which always begins on July 1 and ends on June 30 of the subsequent year. Data are submitted every 6 months.

The main reason to use NY GME demonstration resident data is because they are reported for the common demonstration reporting year (i.e., July 1 to June 30) whereas the IRIS data usually corresponds to the hospital's fiscal year.[1] (The demonstration year coincides with the academic year for most residents.) The rotation start/end dates are used to calculate full-time equivalent (FTE) residents.

The NY GME data has some important limitations compared to the IRIS data. The most important are with the identification of the resident's residency program and the medical school. In the NY GME database, school names are used while in IRIS, standardized codes are used. This makes it difficult to derive algorithms to distinguish U.S. medical schools from foreign medical schools. By contrast, "99999" is the IRIS code for all foreign medical schools.

A compounding problem is that it seems that only the broad description of types of residency (e.g., internal medicine) are usually used in the NY GME data whereas the IRIS software includes codes for internal medicine subspecialties such as cardiology, cardiovascular disease, and pulmonary disease. These problems make it difficult, if not

[1]Since the BBA voluntary resident reduction demonstration has not yet started, its reporting requirements have not yet been stipulated.

impossible, to determine whether only subspecialty residencies are being reduced or whether all residency programs at a hospital are being subjected to the same percentage reductions.[2] It also makes it difficult to ascertain whether the primary care share of residents is changing.

A shortcoming of the IRIS data is that it can not be used to directly ascertain whether a hospital eliminated a specific residency program. The fact that there are no residents for a specific program (e.g., pediatric neurosurgery) could reflect problems finding qualified residents rather than a decision to eliminate the program altogether.

AMA Resident Data. The AMA surveys residency programs through its *Annual Survey of Graduate Medical Education Programs*. As it is a voluntary survey, the AMA does not have a 100% response rate. While the AMA database has some limitations vis-à-vis IRIS data, the AMA database does contain gender and race whereas the IRIS database does not. The AMA database, thus, can be used to supplement the IRIS data to ascertain whether the resident reduction demonstrations disproportionately affect females and racial minorities.[3]

AMA data, however, might be very expensive. Data on just three data elements (gender, race, and sponsoring program)[4] might cost between $3,100 and $3,800 for each year of data requested for all NY hospitals with residency programs. For the BBA demonstration, for all U.S. residents, the cost per year might range from $13,000 to $15,000, or for eight years of data, as much as $120,000 for just the three data elements.

AAMC Resident Data. The AAMC conducts the *National Resident Matching Program* (NRMP) each year, and thus, is a potential source of individual resident data. In particular, NRMP, other AAMC data, and AMA data are used to create the *AAMC GME Tracking Census File*. The NRMP is used primarily to match newly graduated physicians

[2]A further difficulty is that some residency programs might be targeted for reduction in one year while other programs will be targeted for reduction in subsequent years.

[3]Given that the application mix and the academic achievements of the applicants to each program are not available, a disproportionate reduction in female and other minorities is not *prima facie* evidence of discrimination.

[4]In some cases, the sponsoring program is not the hospital in which the residency occurs, but rather a medical school or another hospital.

from U.S. medical colleges (mostly U.S. citizens) with U.S. residency programs. IMGs, thus, are disproportionately missing from the NRMP data and, probably, from the *Tracking Census File*. As part of the NRMP, each residency program (hospital) submits to the AAMC the number of positions (quota) that are available for each type of residency. In principle, thus, this programmatic-level data can be used to ascertain whether a zero value for the filled positions for a specific residency program in a hospital represent recruiting difficulties (i.e., unfilled positions) or the intentional elimination of a program.

HCFA's IRIS data are the best resident-level data available to evaluate the effects of the NY GME and the BBA resident reduction demonstrations as well as for other GME-related provisions of the BBA. Not only are IRIS data the best available, they also appear to be completely suitable for most of the proposed analyses. It appears that AMA data and AAMC data can be used to supplement the IRIS data – at a cost.

E.2 Hospital Cost Report Data

E.2.1 Medicare Cost Reports

Computerized abstracts of Medicare Cost Reports (MCRs) are available through HCFA's Hospital Cost Reporting Information System (HCRIS) for each hospital. HCRIS contains the information necessary to calculate direct medical education (DME) and indirect medical education (IME) payments, PPS margins, total hospital margins, days and discharges (total, Medicare, Medicaid), etc. Aside from Medicare and Medicaid, the only detail MCRs have by payor is for total patients – information, thus, on other insured patients is a residual category. HCRIS data are readily available from HCFA and are available to HCFA contractors at no cost.

E.2.2 New York State Institutional Cost Reports

New York State collects detailed Institutional Cost Reports (ICRs) for all hospitals. These reports are available in electronic format and are similar in content to MCRs. Exhibit 35 of the ICR contains hospital staffing and wage data. The wage data can be used to calculate market-wide hourly average wages for several important occupational groups,

including residents, other physicians, registered nurses (RNs), nurse practitioners (NPs), physician's assistants (PAs), and CRNAs. Market wages indicate how costly it is to substitute labor from other occupational groups. Resident wages can be used to calculate the net cost of residents to teaching hospitals.

Exhibits 32 and 33 of the ICR provide breakdowns of discharges, inpatient days, ambulatory visits, and ambulatory surgery, *inter alia*, for 14 different payer categories. The key groups include: Medicare, Medicaid, indemnity, Medicare HMO, Medicaid HMO, and uninsured. Overall trends in days and discharges can be reported for Medicare, Medicaid, and private patients, broken out by fee-for-service versus HMO. These data can also be used to measure the variation in level and trends in free, courtesy, and uninsured days and discharges by hospital.

Exhibits 23 through 29 in the ICR report Balance Sheet and Income Statement information necessary to evaluate changes in each hospital's financial condition. The forms give better detailed data than MCRs on assets and liabilities and the various fund balances. These financial data also appear more extensive than those provided by demonstration participants in their HCFA progress reports. ICR financial data can be used to develop a set of financial solvency ratios to monitor during the study. These would include the *quick ratio* (current assets/current liabilities), days of cash on hand, the *debt service coverage ratio*, and the percent of buildings and equipment depreciated. Analyses of fund balances can also be performed. Four separate funds are listed on the ICR: *General, special purpose, endowment*, and *plant*. Each implies differing degrees of fungibility to cover losses. The most significant set of financial ratios, the operating and total margins, can also be derived from ICR worksheets.

Several financial impact analyses can also be based on Exhibits 26 and 26a of the ICR dealing with revenues and expenses. These forms allow tracking of changes in revenues decomposed by inpatient/outpatient, hospital routine, ICU, ancillary, home health, etc. They also support trend analysis of revenues from key nonpatient sources such as income from

investments, unrestricted income from endowments, and contributions, donations, and bequests.

E.3 AHA Hospital Characteristics and Staffing

The annual American Hospital Association (AHA) surveys contain information on organizational structure, facilities and services, beds and utilization, and financial data of all U.S. hospitals. The AHA, however, no longer collects extensive staffing data. The AHA now only collects full-time and part-time *facility* staffing data on: (1) physicians and dentists, (2) residents, (3) other trainees, (4) RNs, (5) LPNs, and (6) all other personnel.

Depending on the number of pre- and post- demonstration years of data we need and the commencement date of the BBA resident reduction demonstration, it might be necessary to obtain 8-10 years of data. Since MCRs and AHA data have less financial and personnel detail than the NY ICRs, it will not be possible to perform an evaluation of the GME-related provisions of the BBA with as much analytical rigor as the evaluation of the NY GME demonstration.

E.4 Hospital Claims Data

E.4.1 New York SPARCS Data

New York State's Department of Public Health maintains a uniform hospital discharge abstract system known as the Statewide Planning and Research Cooperative System (SPARCS). Data is submitted according to a designated format and schedule. The SPARCS data contain a 100 percent sample of discharges for all hospitals in the state of New York. In 1993, a Department of Health task force released a new Universal Data Set (UDS) Specification which includes reporting codes for use with the UB-92 paper form and a new electronic format. The SPARCS data are similar to other discharge abstract data sets. Data elements of interest include:

- Unique Personal Identifier-A composite field composed of portions of the patient's last name, first name, and social security number. This field, in conjunction with the Patient's Birth date and Patient's Sex is designed to provide probabilistic matching criteria for

individual patient records for longitudinal analysis without compromising the confidentiality of the record.

- Patient age, sex, race, and ethnicity - It is not certain how accurately race and ethnicity are coded. Age and sex would be expected to be coded correctly

- Homeless Patients - Code indicates if the patient is homeless at the time of discharge

- SPARCS Identification Number - the hospital provider number, composed of the Department of health's four-digit Permanent Facility Identifier followed by a fifth check digit.

- Attending Physician State License Number - The professional license number, issued by the New York State Department of Education, used to identify the physician or other health care professional primarily responsible for the care of the patient.

- Operating Physician State License Number - The professional license number used to identify the physician or other health care professional who performed the principal procedure.

- Patient Status or Disposition - the patient's destination or status upon discharge

- Admission and Discharge Dates

- DRG - the Diagnosis Related Group for the discharge.

- Principal Diagnosis Code and Other Diagnosis Codes - one principal and up to 14 other diagnosis may be entered, using ICD-9-CM diagnosis codes

- Principal Procedure Code and Other Procedure Codes - one principal and up to 14 other procedures may be entered, using procedure codes

- Principal Procedure Date and Other Procedure Dates - for each procedure code, the date on which the procedure was performed

- Source of Admission - whether the patient was admitted through referral, by transfer, through the emergency room, etc.

- Type of Admission - Coded as emergency, urgent, elective, newborn, or not available
- Unscheduled/Scheduled Admission - based on whether the admission was arranged with the hospital at least 24 hours before the admission
- Expected Principal Reimbursement - The code which identifies the payer expected to pay the major portion of the patient's bill
- Expected Reimbursement, Other 1 and 2 - The codes which identify the secondary and tertiary source of payment which is expected to reimburse some part of the hospital bill
- Source of Payment - Coded as self-pay, workers' compensation, Medicare, Medicaid, other federal program, insurance company HMO or PHSP, Blue Cross, or CHAMPUS. Information is provided about each payer (up to a maximum of six); for claims that involve multiple payers, multiple sequences of these record types must be submitted.

Since these files are publicly available, certain fields that might be used to identify the patient have been removed.

For our analysis, we will require a file with date of service information. The DPRB requires researchers to complete an "Application for SPARCS Request Involving Deniable Data" that details the individuals and organization requesting the data, a description of the proposed project, and provides guarantees of confidentiality of the data.

The SPARCS data will be used to conduct four analyses: (1) analysis of changes in the proportion of patients by payer, (2) changes in the mix of conditions and procedures, (3) changes in access to teaching hospitals, (4) and changes in quality of care.

E.4.2 Medicare Claims Data

The Medicare Provider Analysis and Review (MedPAR) file contains inpatient hospital and SNF final action stay records. Each record represents a beneficiary stay in an inpatient hospital or a SNF. Since 1984, MedPAR has included inpatient stay data for all beneficiaries. (Earlier years contained only a 20 percent sample.)

The MedPAR files contain data extracted from the UB-92 discharge abstract summary. Data elements of interest include:

- HICNO - the unique Medicare beneficiary identification number that can be used (in conjunction with the cross-reference file) to track individuals across time.
- Beneficiary age, sex, and race - the number of possible categories for race has recently been expanded, and there are questions as to how accurately this is coded for the new groupings. However, age and sex are obtained from HCFA's enrollment files and are expected to be quite accurate.
- Institutional Provider Number - the unique six digit code that indicates which hospital the patient was treated in.
- Beneficiary Medicare Status Code - whether the person is Medicare eligible because of age, disability, or ESRD status.
- Beneficiary Discharge Status Code - whether the beneficiary was alive at time of discharge.
- Admission and Discharge Dates
- DRG - for admissions reimbursed under prospective payment, the diagnosis related group (DRG) under which payment is made.
- Diagnosis Codes - the current MedPAR files have space for up to 10 diagnoses, using ICD-9-CM diagnosis codes.
- Surgical Procedure Codes - the current MedPAR files have space for up to 6 procedures, using ICD-9-CM procedure codes.
- Surgical Procedure Date - for each procedure code, the MedPAR files have space for the date on which the procedure was performed to be entered.
- Discharge Destination Code - whether the patient was discharged home, or to some other type of facility (other hospital, SNF, etc.)
- Inpatient Admission Source - whether the patient was admitted through referral, by transfer, through the ER, etc.
- Inpatient Admission Type - whether the admission was of an elective, urgent, or emergent nature

Our evaluation of the impact of the national BBA on changes in patient mix, service mix, and quality is similar to that described above for the New York GME demonstration. Unfortunately, we do not have uniform hospital discharge abstract data for all patients treated in U.S. teaching hospitals. However, MedPAR data provide comparable information on Medicare patients, and we will use these data to examine any shifts in the mix of medical conditions treated (identified by diagnosis) or in the mix of surgical procedures.

MedPAR data have been used extensively for research purposes, and HER has used these data on numerous HCFA funded projects. In addition, Dr. Iezzoni has used MedPAR data in extensions of her original CSP work (Iezzoni, 1995). The MedPAR files' national scope and timely availability from HCFA are distinct advantages for this analysis. Although it reflects only the experience of Medicare beneficiaries, we feel CSP rates derived from these data likely reflect the overall quality of hospital care for all patients any changes in hospital quality resulting from the BBA graduate medical provisions are likely to occur because of a reduction in total hospital staffing, or a substitution of resident staff with either less-trained staff, or more highly trained attendings. Such changes would occur on a hospital-wide (or at least department-wide) basis, and affect care for all patients

Appendix F

F

Summary of Perspectives from Other Organizations

The purpose of this appendix is to summarize the results of a series of interviews with representatives of participating New York hospitals, representatives of the Greater New York Hospital Association, and other recognized education experts and organizations "to identify additional evaluation issues and their priorities" and to determine the "relative feasibility of acquiring additional kinds of data to improve the evaluation..."

In preparing a summary of perspectives from other organizations and individual experts concerning the BBA and the resident reduction demonstrations, HER staff contacted and interviewed the following groups:

- Greater New York Hospital Association (GNYHA)
- New York State Health Department
- New York State Council on GME (NYSCGME)
- Prospective Payment Assessment Commission (MedPAC)
- American Association of Medical Colleges
- American Medical Association

In addition, HER staff spoke in personal with several New York experts on various site visits:

- Ed Salsberg, Director of the Center for Workforce Studies, SUNY-Albany
- Charles Brecher, Professor, NYU
- John Billings, Professor, NYU
- John Naughton, M.D., Chairman, NYSCGME

- Linda Landesman, Vice-President, Office of Professional Services & Affiliations, Health and Human Services Corporation

F.1 Greater New York Hospital Association (GNYHA)

The following paragraphs summarize background information provided by key staff with the Association.

Origins of Demonstration. By the mid-1990s, two major changes in New York were occuring that prompted the GNYHA to put together an unsolicited proposal to HCFA seeking financial support for downsizing residents in the state. First, the long-standing hospital rate-setting program in New York (NYPHRM) was being set aside for a more competitive managed care model of hospital cost containment. Second, the federal government was also seriously considering major reductions in the level of Graduate Medical Education (GME) payments to hospitals. These cuts would impact New York hospitals more than any other state given that a significant percentage of all residents train in New York. The GNYHA decided to be very pro-active in light of these major disturbances to the finances of its members. The Association had recognized the need to re-engineer services and downsize residency programs long before entering the demonstration.

HCFA worked with the GNYHA to simplify the demonstration's terms and conditions. HCFA also removed the more favorable financial guarantees requested by the hospitals and established rigorous resident reduction targets, glidepaths, and penalties.

Hospitals' Decision to Participate/Drop Out. Based in part on the GNYHA's strong endorsement, nearly half of all teaching hospitals in the state decided to participate. This was a surprise both to the GNYHA and to HCFA. Besides GNYHA's endorsement, several other factors likely contributed to the high initial participation rate. First was the very short time (officially a month) hospitals had to decide, coupled with the absence of any penalty for dropping out during the first year. A second factor mentioned by GNYHA staff was that some hospital managers and physicians "wanted to do the socially responsible thing." Numerous studies documenting the oversupply of specialists and the possible undersupply of primary care physicians were used to buttress the decision to participate.

Also, some hospitals that were highly dependent on IMGs decided to enter the demonstration and take advantage of transition payments to substitute USMGs and non-physicians for IMGs.

GNYHA staff noted several reasons for hospitals dropping out of the demonstration. Most are idiosyncratic, but one common reason is that the BBA was not nearly as severe, financially, as expected. Indeed, "the BBA was less a take-away than the demonstration." Also mentioned was the built-in implicit transition payments in the BBA generated, for example, by the 3-year rolling count of residents, making the demonstration hold harmless payments with accompanying stringent reduction targets unattractive.

Moreover, some hospitals felt that the fixed maximum intern/resident-to-bed ratio mandated at the end of the demonstration was like "staying in the demonstration for life." In general, "the demonstration has forced hospitals and medical schools to look hard at residency programs and costs." Upon closer examination, however, any feasible changes "leads to 8 percent cuts; not 20 percent" as required by the demonstration. Making the other 10-12 percent cuts are very difficult in most institutions.

State GME Pools. Currently, the New York Health Care Reform Act of 1996 (HCRA) has a GME incentive pool for reducing residents of $54 million. The incentive pool reinforces any demonstration and BBA incentives, which are punitive. The HCRA GME pool will expire at the end of 1999, however, unless HCRA is re-enacted. All of the state GME pools are under attack by private business and the Governor and will surely decline, if not disappear, in 1999.

F.2 New York State Health Department & NYSCGME

Role of State and NYSCGME in Demonstration. New York State is not closely involved in the demonstration. NYSCGME does not have any evaluation of the impact of resident reductions in place, but it does have a website that summarizes key state hospital performance. NYSCGME has strongly supported GME consortia. Several were established in the early 1990s to coordinate the training and downsizing of residency programs. The

earliest was the Buffalo consortium that was established in the early 1980s under NYPHRM. Mt. Sinai's and NYU's consortia have been operational since 1994 under grants from the state to reduce residents.

Hospitals' Decision to Participate/ Dropout. GNYHA and the state expected less than 12 hospitals to participate, but 42 entered in the first phase. State staff felt the main reason for the high participation rate was that hospitals "could apply then withdraw without penalty later."

Subsequent legislation under BBA was not as drastic as expected. Now, many hospitals are not seeing the need to make 20-25 percent cuts in residents given the continued BBA support for residents. Nor does the state believe that a statewide 25 percent cut in residents is doable or necessary.

State GME Pools. The state established a $54 million annual Incentive Pool to pay for resident reductions. As such, the pool provides a second option for reducing residents, one not so stringent as the federal demonstration. To be eligible for payments from the pool, hospitals must only reduce residents at least 2 percent. Pay-outs under the pool are made on a regional basis and distributed within each region based on the relative number of residents eliminated.

GME Consortia, Mergers, & Affiliations. The current set of hospital and medical school arrangements is a complex labyrinth that is in constant flux. Hospitals have formal affiliations with the medical schools to train residents in their facilities. They will also have entered into mergers with other hospitals on entirely other grounds. And they have entered into GME consortia for downsizing and consolidating residency programs. For example the 11 major HHC hospitals form one merged corporation but members have different AMC resident affiliations.

When a consortium member changes affiliation, it "returns" its residents to the previous AMC. This has a ripple effect on the latter's ability to meet HCFA's reduction targets.

Code 405 Resident Work Hours. Code 405 regulations constraining the work hours of residents have been in place since 1989 but have not been strictly enforced until this year. New York State is now in the process of visiting all 115 teaching hospitals to assure compliance with the regulations. The average length of stay in New York dropped by one full day last year, resulting in many unused beds. Thus, it may be possible to simultaneously reduce resident work hours to meet Code 405 requirements as well as absolutely reduce the number of residents in certain hospitals hardest hit by volume reductions.

F.3 The Medicare Payment Assessment Commission (MedPAC)

HER staff talked to Craig Lisk from MedPAC on Monday, March 29, 1999 to solicit his opinions on current Medicare GME issues and to gain some insights relative to the New York State (NYS) GME Demonstration. The following paragraphs summarize Mr. Lisk's observations as the key MEDPAC staff person on GME.

The BBA contains explicit changes in GME payment policy in order to address noted incentives for hospitals to hire more residents to earn greater GME payments. However, there changes have some important limitations. First, while the BBA caps the number of residents facilities may hire, this cap only addresses the incentive to increase residents. It does not address the incentive to maintain programs at current levels.

Under the BBA in Subtitle G, Subchapters A and B, hospitals will be provided indirect and direct medical education costs for Medicare + Choice enrollees. This mitigates any demand effects of growing managed care on residents.

While the demonstration provides only temporary hold harmless payments that diminish over time, it requires long-term reductions that will mean permanent losses in revenue for participants. Lisk predicted a high dropout rate for the demonstration because the money is short lived and the strings attached to earn this money are far too onerous for most institutions. Successful participants will likely be facilities committed to making long-term reductions in residents. It is also likely that these same facilities would have made similar cuts in the absence of the demonstration. For instance, he hypothesized that hospitals

with a historically high dependence on Medicare GME revenues would be most likely to succeed in the demonstration, since they expanded their programs farthest beyond workforce needs during these expansions. Examining the participation decision of such low Medicare share hospitals may yield some interesting information regarding the hospitals and their goals.

F.4 American Association of Medical Colleges

AAMC staff, like most everyone else, were surprised at the number of hospitals that initially enrolled in HCFA's residency reduction demonstration. They had heard that a major reason was the uncertainty in New York surrounding all of the payment changes going on—managed care, changes in state GME pools, Medicaid HMO contracting, plus BBA. AAMC staff believed that the hold harmless incentives were generally weak in encouraging downsizing. They also felt that the lack of targeted incentives under both the New York demonstration and the National Voluntary Education Program relegated the demonstration to participants already planning to downsize significantly.

HER staff asked the AAMC which hospitals might be most inclined to participate in the New York or national residency reduction demonstration. The characteristics suggested included substantial declines in volumes that hamper quality resident education, hospitals with accreditation problems and weak programs, and hospitals experiencing out-rotation problems with their residents.

AAMC staff made several suggestions regarding possible adverse outcomes from the BBA reductions in residents.

- Increases in resident work hours. cause some hospitals to run into problems with Code 405 restrictions on resident work hours.
- Declines in accreditation standing. Reducing residents may force remaining residents to cover too many sites or be forced into more clinical care rather than didactic learning.
- Elimination of entire programs. Once it became clear that a 25 percent across-the-board cut was not feasible given the small size of many programs and RRC

minimal size requirements, whole programs will likely have to be eliminated or the hospital will drop out of the demonstration.

- Changes in the ratio of USMGs to IMGs. It is likely that in reducing residents, hospitals do not uniformly reduce the number of IMGs. IMGs may be more or less inclined to enter primary or specialty care. Maintaining or increasing primary care ratios in the demonstration may inadvertently "protect" IMGs.

Under the BBA, hold harmless GME payments equal 95 percent of base payments in the first year of the national demonstration versus a full 100 percent in New York. This may discourage participation in the national demonstration.

AAMC staff suggested several issues to be addressed in the BBA evaluation.

- Caps on the number of residents. Under the BBA, hospitals must now assure that any changes in rotations they make do not drive other hospitals over or under the caps.

- Alignment of resident rotations, affiliations, and mergers. Also, the very complicated cap rules in BBA may restrict collaborations on resident reductions. This will likely lead to a realignment of rotations and affiliations as hospitals scramble to stay within the caps or downsize.

- Prohibitions on starting new programs. With the resident cap, hospitals will be very reluctant to start new programs. This may stifle the growth in primary care programs in particular. Of interest would be where new programs start up under BBA, if any, stratified by region, urban/rural location, and specialty.

- Changes in ambulatory-based training. BBA provides conflicting incentives for ambulatory-based training. On the positive side, BBA allows residents in non-hospital settings to be counted in the IRB ratio, thereby maintaining the hospital's IME payments. On the downside, BBA requires a new agreement with non-hospital sites requiring the hospital to pay not only the resident's stipend but also for any supervisory physician costs and all related travel costs as well.

- Flows of GME funding support to non-hospital sites. AAMC staff would like to track the flow of these funds, including whether any have been paid to date. Their feedback is that the BBA rules are too complicated and many sites gave up trying to collect such GME payments in 1998.

- Incentives under 3-year rolling average count of residents. No such adjustment exists in the New York demonstration. The relative importance of demonstration hold harmless payments in lieu of a 3-year rolling average count of residents should be determined.

F.5 American Medical Association

To obtain their opinion on the issues that our evaluations of the NY Medicare Graduate Medical Education (GME) Payment Demonstration and GME-related provisions of the Balanced Budget Act of 1997 (BBA) should address, we telephoned the American Medical Association (AMA). Staff, in a written response to questions, suggested that the following questions be addressed in the evaluation.

- Characteristics of Participating Hospitals. What were the characteristics of hospitals that chose to enter and remain in the NYS and BBA demonstration projects? Are there any similarities among the hospitals that successfully met their reduction targets, either in the characteristics of the institution or in the process used to make reductions?

- Setting Resident Reduction Targets. How were resident reduction targets set across specialties? Who participated in the setting the targets across specialties? What types of data were used to set reduction targets? Did the process used to set targets inpact the outcome (e.g., decision to remain in the NYS project, eventual success in both the NYS and BBA projects)? What methods were used to reduce the number of residents? Were reductions taken proportionately across all programs or were only some programs targeted? Were quality measures used in determining which programs would be cut? Who decided which hospital "claimed" a resident? If residents rotated among hospitals, were fractions of an FTE counted by each hospital?

- Effects of the Environment on Participation and Success. Did the environment of the hospital (e.g., populations served, managed care penetration) impact the initial decision to participate, the process by which reductions were introduced, and the outcome (e.g., remaining in the program, achieving targets)? Did the financial status of the hospital as a result of the BBA affect the willingness of the hospital to enter or remain in the NYS or BBA reduction programs?

- Mechanisms to Cover Residents. What was the balance of personnel used to replace residents (e.g., ratio of physicians to non-physicians)? How did this balance impact cost and quality of care? What were the characteristics of physicians hired to replace residents (e.g., were these hospitals, IMGs)? What

specialties were hired? What were the characteristics of non-physicians who replaced residents (e.g., new hires or reassignments, what types of health professionals)? How many and what types of non-physicians were needed to replace a resident? How was the non-physician staff who replaced residents trained, supervised, and evaluated to ensure continuing quality of care?

- Consequences of Resident Reductions. Did the characteristics of residents change in hospitals participating in the demonstration projects? Were the hospitals less competitive in the match? How did the reductions impact the work and educational schedules of residents across specialties? Was there an impact on educational quality (e.g., as reflected in ACGME accreditation findings)? Was there resident attrition through "dropping out" or transfer? Was there an impact on resident work hours or on the duties that remaining residents performed (e.g., more SCUT)? How were resident grievances/concerns about work hours and working conditions addressed? How did the reduction in residents impact the educational program for medical students (if medical students rotated at the hospital)? Did the changes resulting in the number of residents create conflict/pressures with such things as ACGME accreditation requirements (e.g., for work hour limitations) or resident contracts? If so, how were problems resolved? Did reductions in resident numbers impact any of the services available in the hospital or its outpatient clinics (e.g., elimination of services, changes in the availability of services)? Was there an impact on the cost of care, including length of stay, utilization of services?

- Changes in the IMEA (Section 4621). Were any types of hospitals disproportionately affected by the reduction in the IMEA multiplier and the cap on residents? Were any regions of the country disproportionately affected? Were any populations/patient groups disproportionately affected?

- Payments for Direct Cost of Medical Education (Section 4623). How did the cap affect growing regions of the country (e.g., areas with significant population growth or shift in population demographics) and growing specialities that may have a need for additional residents? How did the cap impact the formation and evolution of consortia?

- Payments to Non-hospital Providers (Section 4625). How did this impact the sites used for training (e.g., shift to out-of-hospital sites) and the curriculum of residency programs?

F.6 Edward Salsberg, Ph.D.

Ed Salsberg is a health economist at SUNY-Albany who has studied health care workforce issues in New York and elsewhere for many years. The following paragraphs summarize the key points of his interview. In 1998, Salsberg surveyed all 4,500 graduating residents in New York on their satisfaction with their training and their job opportunities. Five years earlier, Salsberg had suggested that the New York Hospital Association negotiate with HCFA on lowering GME payments but their members vetoed the idea. Then, in 1995, Congress passed a major reduction in GME payments that changed the hospitals' thinking, even though the President vetoed the bill. This threat strongly encouraged the GNYHA to pursue a hold harmless GME reduction demonstration.

Hospitals' Decision to Participate. The BBA incentives to downsize turned out to be weaker than expected. Only hospitals already planning to downsize residency programs showed interest in the demonstration. That so many AMCs decided to enter was a surprise. The decision was driven by the highest level decision-makers in the institution--CEOs and Trustees--acting forcefully over their department chairmen. Experience showed that "ground-up" approaches to cutting residents was bound to fail. No program managers want to cut their programs; hence, no common ground exists for cuts.

Many IMG-dependent hospitals chose not to participate even though they would seem prime candidates for downsizing weak programs. This was possibly due to the fact that in eliminating IMGs they "wouldn't save faculty salaries" because there weren't any around to begin with; IMGs were being used strictly as labor.

Historically, AMCs have been enjoying significant economic rents from the teaching arrangement with HHCs that Central Office is now reclaiming through tougher contracts. A major implication for the evaluation is that HHC hospitals may well be able to substitute more attendings for fewer residents given the scramble for patients to support teaching programs. Another important factor in HHC's participation is the fact that "most of the bed days lost in the City have been in HHC hospitals."

The primary care-specialist ratio has been a significant problem for many hospitals. Part of the problem is HCFA's interpretation of "primary care." All internal medicine residents are counted as primary care even though many go on to specialize in predetermined tracks. Salsberg estimates as many as two-thirds of Internal Medicine (IM) resident programs are not really primary care but a feeder to specialized medical care. The New York State Health Department recognized that not all internists are equal and upweighted specialized IM residents. Thus, cuts in these residents counts for more in distributing the resident downsizing pool.

State GME Pools. Together, New York Medicaid and private payers pay $1.4 billion in GME alone. These funds are carved out and paid hospitals directly. Medicare pays another estimated $1 billion in GME (DME & IME), resulting in $2.4 billion annually. Thus, hospitals are highly dependent upon GME payments for financial success.

Most of the GME payments go to safety net hospitals, broadly defined to include many downstate AMCs operating in poor neighborhoods.

F.7 Charles Brecher, Ph.D.

Mr. Brecher is a professor and researcher at the NYU Wagner School of Public Affairs. Mr. Brecher has been studying New York hospitals and health care for over 20 years. He is currently conducting an in-depth study of the uninsured in New York and making recommendations for covering the uninsured.

The Uninsured in New York. Currently, 19 percent of the New York statewide population lacks health insurance. In New York City, the percentage ranges from 25-28 percent. Uninsured rates have been rising. One reason for the rise in the uninsured is the rapid influx of immigrants who are ineligible for Medicaid. According to Brecher, there is roughly the same percentage of foreign born in New York City today as in 1910.

There is a surprisingly small percentage of uncompensated hospital inpatient care given such high uninsured rates. This, Brecher claims, is due to the very generous Medicaid spend-down provisions.

Managed Care. New York Medicaid has pursued managed care enrollment for its population on a voluntary basis for several years. Now, roughly 350,000 Medicaid enrollees are in managed care, mostly in New York City. The state is still waiting to receive its mandatory managed care waiver from HCFA.

State GME Pools. The Business Council is lobbying to do away with the state GME pools, calling them "the 13th month premium" employers have to pay. The Citizens' Council is recommending to take a percentage of the GME-dedicated funds and spend them more directly on care for the uninsured. The Governor is attempting to reduce support for GME but may extend the HCRA legislation authorizing the GME pools for another year.

F.8 John Billings

He is a Professor at the Wagner School for Public Policy at NYU. Professor Billings is well-known for his work on healthcare access and pioneered the conceptual and empirical development of Ambulatory Care Sensitive Admissions.

Medicaid Managed Care in New York City. New York is receiving $1.2 billion from HCFA to help make the transition to Medicaid managed care over five years. There was an initial upsurge of interest on the part of hospitals that traditionally had not treated Medicaid patients, such as Montefiore and Mt. Sinai. As a result, HHC hospitals have lost market share, down from 40 percent to 29 percent of all Medicaid inpatient stays. The losses have come predominantly from OB and substance abuse patients.

On average, capitation rates have been falling and the for-profit plans (e.g., Oxford, United Health Care, etc.) are exiting the Medicaid managed care market. The remaining plans tend to be hospital-dominated, provider-sponsored plans, such as Health First and Metro Plus. These plans are also in financial trouble because they have not been able to enroll the expected volume of Medicaid patients for two reasons. First, Medicaid managed care is being implemented on a transitional basis and, to date, only 20 percent of beneficiaries have been phased in. Second, the potential pool of Medicaid enrollees has

decreased sharply, due to welfare reform. At the same time, the number of uninsured in the city has risen dramatically.

Primary Care Capacity in New York City. Because the physician-population ratio is so high in NYC, *even excluding residents*, Billings does not believe that the residency reduction program are likely to impact access. Nevertheless, there are some pockets within the city that appear to have a shortage of primary care providers, e.g., central Harlem, south east Queens, and parts of Brooklyn.

F.9 John Naughton, M.D.

Dr. Naughton is both a professor of medicine at SUNY-Buffalo as well as the Chair of the New York State Council on GME.

Origins of Demonstration. The first consortium of hospitals surrounding GME was formed in Buffalo in 1983. In the consortium's early years, it helped hospitals set goals in reducing programs and promoting primary care with greater opportunities for ambulatory training. In the late 1980s, the consortium worked together to implement the Code 405 regulations mandating limits to resident work hours. Thus, for a long time, Buffalo hospitals have recognized the need to reduce residents and the oversupply of physicians.

Managed Care. The Buffalo market is quite overbedded. Dr. Naughton estimates there are over 2,000 extra beds in the city, making it a good managed care target. A s managed care gets tougher—now it is mostly discounted fees with little patient management -- hospitals in the GME consortium will begin to compete more, leading possibly to the eventual breakup of the consortium.

It is clear that previous regulation under NYPHRM supported the have-nots. Now under managed care and competition for patients, the have-nots are scrambling to maintain their patient base. This likely means emphasizing residents for financial and patient care reasons.

State GME Pools. The state has always consciously used GME to serve poor people unlike most other states. Eventually, the state will be forced to separate the support of medical education from uncompensated care and serving poor people.

F.10 Linda Landesman, Ph.D.

Linda Landesman, is Vice President of Professional Services and Affiliations with the Health and Hospitals Corporation (HHC), and is responsible for negotiating affiliation contracts between New York academic medical centers and the HHC hospitals.

HHC hospitals develop their own networks and GME affiliations but under single HHC fiscal entity. HHC Central Office is responsible for all affiliation contracts and demo arrangements. Today, all HHC hospitals contract for attendings rather than hire them.

HHC for some time has been less than satisfied with the supervisory support the AMCs were providing their member hospitals. In 1995, Central Office initiated performance-based MD contracts, demanding, among other things, that attendings see 4,000 patients instead of 2,000 annually. Central Office has made changes in payment arrangements as well. Previously, HHC paid $60 million annually to arrange attending support of residents in their member hospitals. Now, affiliated Academic Medical Centers get paid on volume and staffing models. Contracts now extend coverage hours in HHC facilities. Targets are set and payments reduced if volume and staffing requirements are not met.

Hospitals' Decision to Participate & Drop Out. As of January 1999, in a meeting of HHC directors, Central Office thought all 11 hospitals were strongly committed to staying in demonstration. Since then, several HHC hospitals have notified HCFA they are dropping out of the demonstration. HHC Central Office saw the decline in HHC volume as the primary reason for downsizing residents.

Impact of Resident Reductions on Patient Care. HHC Central Office did not believe that its member hospitals were relying to any degree on residents to deliver patient care. With the new affiliation contracts and tough performance criteria, staff believed that

residents were getting adequate supervisory support from academic attendings and not being overburdened with patient care. Attendings were now required to spend more time in HHC hospitals taking care of patients.